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ABSTRACT

This curriculum guide is designed to help horticulture teachers in North Carolina high schools plan and deliver instruction. The guide contains a list of the 39 competencies included in Horticulture I and the 44 competencies included in Horticulture II. It also contains five units of instruction for Horticulture I and eight units for Horticulture II. For each unit of instruction, the following are identified: course name and number, teaching unit title, approximate teaching time, competency statement, and instructional objectives. This page is followed by a content outline, teaching activities, and resources. A reference list keyed to the resources section includes titles and/or vendor names for textbooks, slide sets, filmstrips, videotapes, periodicals, and computer programs. (KC)

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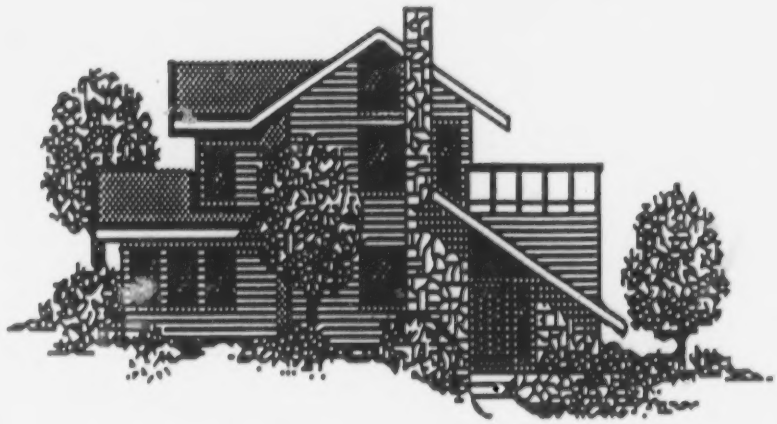
CURRICULUM GUIDE

AGRICULTURAL EDUCATION



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HORTICULTURE I -- COURSE NO. 6841

HORTICULTURE II -- COURSE NO. 6842

Bob Etheridge, State Superintendent
North Carolina Department of Public Instruction

Division of Vocational Education Services
Raleigh, North Carolina

August 1990

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TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

PREFACE

The horticulture industry is an important part of our daily lives. Each day, we encounter the many aspects of horticultural products and services. For example, fruits and vegetables provide critical portions of our diets. Green plants and flowers are grown and sold for their beauty, for use in home decorating, for making places of work more attractive, and for use in recreational areas. Turfgrass is used on lawns and for sodded areas, such as golf courses. Ornamental trees and shrubs are used to landscape residential and commercial buildings, and to provide additional privacy.

As the demand for horticultural products and services has increased, the need for trained horticulturists to assume jobs and careers in horticulture has also increased. Horticulture industries and businesses have grown enormously and these firms need employees to produce and to provide related services. For example, floriculturists grow and market flowers and foliage plants. These floral products are used for weddings and funerals as well as floral displays in the home. In conjunction with providing these products, the floriculturists will often supervise arranging of flowers and floral displays on the premises. Another example of horticultural service jobs involves landscape maintenance firms that provide services to homeowners and businesses by installing and maintaining landscapes. These firms' employees assist in the landscape installation and maintenance.

This guide is to develop competencies needed for employment in horticultural occupations and for advanced technical training. The guide is flexible and may be changed to meet the needs of the local school situation. However, competencies in Horticulture I - 6841 are basic to entry level preparation and should be mastered before students progress to Horticulture II - 6842.

Each student should be involved in supervised agricultural experiences related to each unit of instruction. Also, leadership abilities needed for success in ornamental horticulture are developed by the FFA as an integral part of the instructional program.

ACKNOWLEDGEMENTS

We are grateful to the following business/industry DACUM committee members for identifying the skills needed in horticultural occupations in North Carolina:

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Jerry Whitley	Metrolina Greenhouses, Huntersville, NC.

Appreciation is expressed to teachers of agriculture who participated in the identification of competencies for horticulture and for arranging them in sequential order. Next we express appreciation to the following teachers who contributed by writing units of instruction:

Raymond Caviness, Eastern Randolph High School
Herman Croom, C. B. Aycock High School
Roger Newby, West Carteret High School
Julian Smith, Chatham Central High School
Michelle Spence, North Lenior High School
Beth Wilson, Jordan High School

INTRODUCTION TO THE CURRICULUM GUIDE

The curriculum guide is designed to be used by teachers of Horticulture I and Horticulture II courses in North Carolina. The guide is not a substitute for lesson plans , but rather an instructional planning tool to assist the teacher in delivering instruction for Horticulture students.

The course design, explained on page one of the guide, indicates that the horticulture courses are to be taught after a student completes Introduction to Agriculture and Natural Resources. Horticulture I , No. 6841, contains five broad units of instruction. A list of the 39 competencies included in Horticulture I may be found on page 3 of the Guide. Units of instruction and competencies found in Horticulture I are basic to the understanding of content found in Horticulture II. Horticulture II, No. 6842, contains eight broad units of instruction and 44 competencies.

For each unit of instruction, beginning on page nine, the following are identified: Course name and number, Teaching Unit Title, approximate teaching time, Competency Statement, and Instructional Objectives. The area under Test Item Numbers has been left blank so that teachers may write in appropriate information as the test banks are developed and revised. This page is followed by the Content Outline, Teaching Activities, and Resources.

The Content Outline is a suggested outline for the teacher. It's purpose is to give the teacher some ideas and structure for teaching relative to the competencies. As agriculture and technology changes, the teacher needs to adapt to the changes by revising the content.

Teaching and learning activities are also suggested ideas for involving students in the learning process. These have been suggested by teachers in the Horticulture area. They are not conclusive so teachers should include additional activities to fit their unique situations.

A Reference list is included at the end of the Guide. The list includes titles and/or vendors names for: text books, slide sets, filmstrips, video tapes, periodical, and computer programs. Again, as agriculture and horticulture changes, additional information should be sought. The Agricultural Extension Service, land grant universities, and business and industry are excellent sources for current information.

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COURSE DESIGN

Horticulture I, 6841, is designed to be taught after students have completed Introduction to Agriculture and Natural Resources. The course contains five broad units of instruction, specifying 39 competencies. The focus of the course is on basic knowledge and skills for Horticulture, upon which all students should be able to build as they choose areas of specialization in Horticulture II. Horticulture II, 6841, contains eight broad units of instruction and includes 44 competencies. The first level may be offered at grade 10, the second at grade 11, and further specialized courses at grade 12. In some cases, teachers may need to modify courses to meet local needs. Permission and counsel from the State Department of Public Instruction, Agricultural Education, should be sought in this case.

COURSE OUTLINE AND TEACHING UNITS

HORTICULTURE I - 6841

A. Leadership Development
   1. Using FFA Activities Effectively
   2. Demonstrating Parliamentary Procedure Abilities
   3. Prepare and Deliver a Five Minute Speech
B. Supervised Agricultural Experience Programs
   1. Identify Basic Employment Skills Needed to Enter the Labor Market
   2. Supervised Agricultural Experience
   3. Records and Financial Management
   4. Computerized Recordkeeping
   5. Entrepreneurship
C. Plant Growth, Development and Reproduction
   1. Plant Growth and Development
   2. Role of Biotechnology
   3. Genetic Engineering
   4. Scientific Methods
D. Soils, Nutrients, and Fertilizers
   1. Soil Characteristics
   2. Soil Nutrients and Fertilizers
   3. Soil Mixes and Media
E. Pest Management
   1. Identification and Plant Pest Management
   2. Pest Management and Safe Control

HORTICULTURE II - 6842

A. Supervised Agricultural Experience
    1. Customer Relations
    2. Marketing Horticultural Products
B. Pest Management
    1. Plant Pest Management
    2. Pest Control and Pesticide Safety
C. Greenhouse Plant Production
    1. Greenhouse Equipment
    2. Bedding Plant Production
    3. Potted Plant Production
D. Landscape Design and Maintenance
    1. Landscape Design and Interiorscaping
    2. Landscape Design
E. Landscape Maintenance
    1. Landscape Soil Preparation and Maintenance
    2. Landscape Maintenance: Pruning and Planting
    3. Landscape Maintenance and Weed Control
    4. Landscape Equipment Care and Safe Operation
F. Floral Design
    1. Products and Materials
    2. Floral Design and Marketing
G. Nursery Production
    1. Nursery Production Practices
H. Lawn Establishment
    1. Lawn Grasses/Lawn Seed Bed Establishment
    2. Lawn Establishment: Sods, Sprigs or Plugs

AGRICULTURAL EDUCATION
COURSE 6841 - HORTICULTURE I
COURSE 6842 - HORTICULTURE II

COMPETENCY STATEMENT		CORE	6841	6842
A. Leadership Development (3 weeks)				
001.	Preside over chapter and committee meetings	X	X	
002.	Perform correctly 14 parliamentary procedure abilities	X	X	
003.	Prepare and present a five minute speech	X	X	
B. Supervised Agricultural Experience (3 weeks)				
004.	Identify skills needed to enter the horticultural labor market	X	X	
005.	Describe horticulture	X	X	
006.	State the importance of horticulture in relation to the international, national, state, and local economy	X	X	
007.	Identify occupations in the field of horticulture	X	X	
008.	Identify supervised agricultural experiences in horticulture available at school, at home, or with industry	X	X	
009.	Make an inventory of assets and liabilities	X	X	
010.	Keep an up-to-date record book including expenses, receipts, work performed, and a financial statement	X	X	
011.	Use computerized record keeping and reporting system software	X	X	
012.	Describe entrepreneur license requirements	X	X	
013.	Identify customer relations techniques for working in the horticulture business including handling customer requests, objections, and complaints			X
014.	Advertise and display items for sale in a horticulture business			X
C. Plant Growth, Development, and Reproduction (16 weeks)				
015.	Identify principles of plant science as related to horticulture	X	X	

COMPETENCY STATEMENT	CORE	6841	6842
016. Describe the scientific relationships among horticultural plants	X	X	
017. Explain the functions and identify the anatomical parts and distinguishing characteristics of horticultural plants	X	X	
018. Use computerized instructional programs	X	X	
019. Analyze the process of growth in horticulture plants	X	X	
020. Identify common horticultural plants	X	X	
021. Identify, describe, and perform different methods of plant propagation	X	X	
022. Describe the role of biotechnology in horticulture	X	X	
023. Identify uses of biotechnology in horticulture	X	X	
024. Describe the use of applied genetics in horticulture	X	X	
025. Use scientific research methods to develop a paper and/or project	X	X	
D. Soils, Nutrients, and Fertilizers (7 weeks)			
026. Identify and describe properties of soils used for horticultural plants	X	X	
027. Identify, describe, and demonstrate proper use of nutrients used for horticultural plants	X	X	
028. Take soil samples and describe utilization of results or findings	X	X	
029. Identify and describe the use of different soil mixes	X	X	
030. Recognize ingredients for the following media: (1) rooting, (2) potting, (3) fine seeded, when given a choice of materials	X	X	
E. Pest Management (7 weeks)			
031. Identify distinguishing characteristics of pests and their growth habits		X	X
032. Identify ornamental horticultural plant pests and prescribe the methods of control	X	X	

COMPETENCY STATEMENT		CORE	6841	6842
033.	Describe and perform alternative methods of pest control	X	X	
034.	Interpret chemical labels	X	X	X
035.	Use agriculture chemical manuals to determine the appropriate chemical for use	X	X	
036.	Identify proper use of chemicals	X	X	
037.	Determine the type of pest(s) that the pesticide is designed to control when given labels from various commonly used pesticides	X	X	
038.	Demonstrate safety precautions for handling and mixing pesticides when given various commonly used pesticides	X	X	
039.	Demonstrate safe disposal and storage of pesticides when given surplus pesticides and containers	X	X	
A. Greenhouse Plant Production (12 weeks)				
001.	Describe selected functions of a greenhouse	X		X
002.	Regulate greenhouse equipment to control temperature, light, and moisture			X
003.	Identify maintenance items in connection with greenhouse management			X
004.	Identify selected bedding plants according to growth habit and use	X		X
005.	Identify several problems related to growing bedding plants	X		X
006.	Seed bedding plants in hot bed or seed flat	X		X
007.	Prepare media and transplant bedding plants to appropriate containers	X		X
008.	Operate and maintain lighting and shading systems to provide optimum conditions when given a specific variety of floral crops and an equipped greenhouse			X
009.	Operate and maintain automatic watering systems, and hand water potted bench and bed grown crops according to specified procedures when given floral crops to be grown in an equipped house	X		X

COMPETENCY STATEMENT		CORE	6841	6842
010.	Construct a hanging basket using appropriate horticultural materials			X
B. Landscape Design and Maintenance (12 weeks)				
011.	Describe a landscape plan and its use	X		X
012.	Create a landscape plan for a house and grounds and/or commercial application	X		X
013.	Render a landscape plan using appropriate materials			X
014.	Develop a competitive bid for a landscape plan			X
015.	Use CAD/CAM programs to develop landscape plans			X
016.	Describe the importance of interior landscaping	X		X
017.	Identify those plants that will fit the space in interiorscaping			X
018.	Create an interior plan for a shopping center or other specified facility			X
C. Landscape Maintenance (3 weeks)				
019.	Plant or transplant selected ornamental plants	X		X
020.	Plant different kinds of bulbs			X
021.	Identify proper methods of maintenance and care of plants after planting	X		X
022.	Demonstrate the recommended method of watering newly planted stock when given newly planted landscape plants and trees	X		X
023.	Explain how to sterilize soil with methyl bromide or other chemicals for planting beds			X
024.	Prune different kinds of ornamental plants			X
025.	Demonstrate the procedure for removing and/or repairing the injury when given an injured tree or shrub			X

COMPETENCY STATEMENT	CORE	6841	6842
026. Perform corrective pruning procedures to develop a more balanced and compact appearance when given an odd shaped shrub			X
027. Shear to maintain a thick and compact growth which will match the desired conformation when given a formal hedge and the intended conformation	X		X
028. Espalier an ornamental plant			X
029. Identify weeds growing in ornamental plants and recognize and construct appropriate procedures and processes necessary for controlling the weeds			X
030. Safely operate and maintain landscaping equipment changing oil and oil filter and servicing all areas needing lubrication	X		X
D. Floral Design (3 weeks)			
031. Identify selected flowers, plants, and materials used in floral arrangements	X		X
032. Make at least two of the following arrangements to the satisfaction of the instructor or employer when given adequate plant materials, containers, and accessories: a. centerpiece b. hospital arrangement c. corsage d. basket e. wedding bouquet			X
033. Prepare a potted plant for sale			X
E. Nursery Production (3 weeks)			
034. Analyze the various accepted principles in growing nursery stock	X		X
035. Demonstrate accepted procedures for growing container stock			X
036. Plant bare root, balled and burlapped and container nursery stock			X
037. Prepare specimens for mist bed propagation according to recognized criteria when given hardwood and softwood stem parts and a knife			X

COMPETENCY STATEMENT	CORE	6841	6842
038. Stratify and scarify seeds to improve germination when given various samples of seeds			X
F. Lawn Establishment and Maintenance (3 weeks)			
039. Identify lawn grasses adapted to the local area and the environmental requirements for each			X
040. Identify the steps in preparing a lawn seedbed			X
041. Prepare lawn seedbed properly			X
042. Seed a lawn correctly			X
043. Establish or repair a lawn using sprigs, sod, or plugs			X
044. Describe several problems involved in establishing and maintaining lawn grass	X		X

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 1 (3-6 HOURS) TEACHING UNIT TITLE: Using FFA Activities Effectively

COMPETENCY STATEMENT	TEST ITEM NO.
001. Preside over chapter and committee meetings.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

001.1 Possess a current knowledge of FFA activities so that organizational structure can be carried out effectively.

001.2 Be familiar with the different committees in the FFA.

001.3 Have knowledge of duties and responsibilities of officers.

001.4 Demonstrate abilities to preside over FFA Chapter and Committee meetings.

CONTENT	TEACHING ACTIVITIES	RESOURCES
001. I. FFA Structural Organization A. Local Level 1. Chapter Officers 2. Local Program of Work B. Federation Level 1. Federation Officers 2. Federation Program of Work C. District Level 1. District Officers 2. District Program of Work D. State Association 1. State Officers 2. State Program of Work E. National Organization 1. National Officers 2. National Program of Work F. Recent Changes in FFA 1. New Contests 2. Contest Revisions	1. Require all students to keep a notebook of all materials given as handouts during the school year. Duplicate key FFA materials from State Guide to FFA Activities and make this the first part of the notebook. 2. Give each student Official FFA Manual or at least let every student have access to manual. 3. Test students each year, after instruction, on officers at each organizational level. 4. Invite Federation, District, or State officer to speak to Chapter. 5. Take members to FFA Camp, State Leadership School, State Convention, National Convention, and District Rallies to observe the organizational structure and to develop leadership ability.	Official FFA Manual State Guide to FFA Activitie FFA Catalog FFA Publications

CONTENT	TEACHING ACTIVITIES	RESOURCES
II. FFA Committees A. Standing Committees B. Appointed Committees C. Responsibilities of Committee Members III. FFA Chapter Officers A. Duties of Officers 1. President 2. Vice-President 3. Secretary 4. Treasurer 5. Reporter 6. Sentinel 7. Chaplain B. Election of Officers	1. Every member should be on a standing committee. 2. The chapter should cooperatively prepare a local program of work. 3. Every member should have the opportunity to preside over a meeting either at chapter level or in the classroom. 4. Create "Family of Students" concept for all FFA members. 5. Students should be encouraged to pay FFA dues and become FFA members. Develop a FFA member chart and post at front of classroom. Keep up-to-date as members pay dues.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 2 (3-6 HOURS) TEACHING UNIT TITLE: Demonstrating Parliamentary Procedure Abilities

COMPETENCY STATEMENT	TEST ITEM NO.
002. The learner will perform correctly 14 parliamentary procedure abilities.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

002.1 Define parliamentary procedure.

002.2 List 5 reasons for the use of parliamentary procedure.

002.3 Demonstrate correctly the use of at least 14 parliamentary procedure abilities.

CONTENT	TEACHING ACTIVITIES	RESOURCES
002. I. Parliamentary Procedure A. What It Is B. Why Use It 1. Creates order 2. Shortens meetings 3. Protects minority rights 4. Allows each one to present their views. 5. Conducts business in an organized fashion.	1. Have students write a short paper on "What I Think Parliamentary Procedure Is" before beginning and after completion of the unit. 2. Have students describe how they think a meeting would proceed without the use of parliamentary procedure.	Official FFA Manual FFA Student Handbook State Guide to FFA Activities
II. Demonstrating Abilities A. Simple Motion of Business B. Motion and One Amendment C. Appeal the Decision of the Chair D. Division of the House E. Point of Order F. Lay on the Table G. Motion to Adjourn H. Refer to a Committee I. Motion to Reconsider	1. Have students describe either orally or in writing how six abilities are used in a meeting. 2. Divide the class into groups of six and let each group conduct a mock meeting, using parliamentary procedure abilities correctly. 3. Use correct parliamentary procedure in all meetings.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
J. Take from the Table K. Suspend the Rules L. Change Chairperson's Station M. Motion with Two or More Amendments N. Stop Discussion and Vote on the Question	4. Make class chart. On side of chart list students names. Across top list parlimentary procedure abilities. During class participation, record marks by student names as they perform various abilities. Let students know that participation will be part of their grade. 5. Enter federation parliamentary procedure contest.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 3 (3-6 HOURS) TEACHING UNIT TITLE: Prepare and Deliver a 5 Minute Speech

COMPETENCY STATEMENT	TEST ITEM NO.
003. Prepare and present a five minute speech.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

003.1 Prepare a speech related to agriculture or FFA.

003.2 Deliver a prepared speech in the classroom or in a public situation.

CONTENT	TEACHING ACTIVITIES	RESOURCES
003 I. Preparing a Speech A. Outline of Speech B. Writing of Speech C. Footnotes D. Bibliography II. Delivering a Speech A. Appearance 1. Official Dress 2. Stance B. Voice 1. Pronunciation 2. Enunciation 3. Volume 4. Variety C. Response to Questions 1. Positive and Direct Answers 2. Honesty 3. Originality	1. Every student should prepare a speech. 2. Purchase tapes of national speaking contest and let students listen and learn from them. 3. Have students do both prepared and extemporaneous speeches. 4. Chapter should enter all speaking contests. 5. Encourage members to attend leadership schools and to become involved in church and community activities involving speaking skills. 6. Video state finals in both prepared and extemporaneous speaking contest and use in classroom. 7. Refer to state Guide to FFA Activities and acquaint students with FFA speaking rules and amounts of money to be won.	State Guide to FFA Activities

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 4 (1-2 HOURS) TEACHING UNIT TITLE: Identify Basic Employment Skills Needed to Enter the Labor Market

COMPETENCY STATEMENT	TEST ITEM NO.
004. Identify skills needed to enter the horticultural labor market.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

004.1 Recognize skills necessary to work in various horticultural jobs.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 5 (3 HOURS) TEACHING UNIT TITLE: Supervised Agricultural Experience

COMPETENCY STATEMENT	TEST ITEM NO.
005. Describe horticulture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

005.1 Identify and describe the broad field of horticulture and differentiate the divisions of horticulture.

CONTENT	TEACHING ACTIVITIES	RESOURCES
004. I. Vocational Guidance A. Occupational Opportunities B. Occupational Information C. Personal Interest D. Personal Aptitude	1. Provide references for classroom study. 2. Discuss employment skills needed to enter the Horticulture labor market. 3. Have guidance counselor give interest and aptitude inventories to the students and interpret the information discovered.	47, 78, 88
005. I. Horticulture Defined A. Origin B. Commercial Enterprise C. Orchards, Lawns, and Ornamental Plantings D. Affects and Influence on People E. Provides a Large Portion of our Food Supply F. Leisure Time, Hobbies, etc. G. Adds Beauty to Surroundings	1. Provide references for classroom study. 2. Visit homes and/or buildings where results of horticulture work are evident. 3. Visit horticulture businesses and/or invite horticulture personnel in to talk to horticulture students.	14, 31, 47, 78

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 6 (2 HOURS) TEACHING UNIT TITLE: Supervised Agricultural Experience

COMPETENCY STATEMENT	TEST ITEM NO.
006. State the importance of horticulture in relation to the international, national, state, and local economy.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

006.1 Identify five reasons why horticulture is important to our economy.

CONTENT	TEACHING ACTIVITIES	RESOURCES
006. I. Horticulture Defined A. Origin B. Commercial Enterprise C. Orchards, Lawns, and Ornamental Plantings D. Affects and Influence on People E. Provides a Large Portion of our Food Supply F. Leisure Time, Hobbies, etc. G. Adds Beauty to Surroundings	1. Provide references for classroom study. 2. Visit homes and/or buildings where results of horticulture work are evident. 3. Visit horticulture businesses and/or invite horticulture personnel in to talk to horticulture students.	14, 31, 47, 78

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 7 (2 HOURS) TEACHING UNIT TITLE: Supervised Agricultural Experience

COMPETENCY STATEMENT	TEST ITEM NO.
007. Identify occupations in the field of horticulture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

007.1 Identify career fields in the area of horticulture.

007.2 Identify job opportunities in the area of horticulture.

007.3 Identify skills needed in horticultural careers.

CONTENT	TEACHING ACTIVITIES	RESOURCES
007. I. Horticulture Occupations A. Occupations and Employment B. Ornamental Horticulture C. Horticultural Science D. Basic Botany E. Basic Horticultural Soils and Fertilizers F. Pest Identification and Control G. Managing Greenhouse and Equipment H. Growing Flower Crops I. Designing Floral Arrangements J. Growing Bedding Plants K. Growing House Plants L. Pruning and Training Plants M. Identifying Plant Materials N. Planning the Landscape O. Landscaping Practices P. Growing and Caring for Plants Q. Propagating Plants R. Growing Nursery Stock S. Growing Turfgrass	1. Provide references for classroom study. 2. Make home study assignment. 3. Take the students on field trips to see the results of good ornamental horticultural practices. 4. Review with the students the contents of the course as it will be taught in the local school. 5. Tour the school greenhouse facilities.	14, 31, 34, 47,88

CONTENT	TEACHING ACTIVITIES	RESOURCES
II. Vocational Guidance A. Occupational Opportunities B. Occupational Information C. Occupational Requirements D. Personal Interest E. Personal Aptitudes F. Relating Information Learned About Ornamental Horticultural Occupations to the Personal Interests and Aptitudes of the Student G. Educational Requirements	1. Provide references for classroom study. 2. Have students list the ornamental horticulture occupations in the school area. 3. Have each student interview at least one person employed in ornamental horticulture and give an oral report to the class. 4. Have the guidance counselor give interest and aptitude inventories to the students and interpret the information discovered. 5. Conduct field trips to several educational institutions providing training in ornamental horticulture.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 8 (1 HOURS) TEACHING UNIT TITLE: Supervised Agricultural Experience

COMPETENCY STATEMENT	TEST ITEM NO.
008. Identify supervised agricultural experiences in horticulture available at school, at home, or with industry.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

008.1 Describe types of SAE programs.

008.2 Plan and implement an individual SAE program.

CONTENT	TEACHING ACTIVITIES	RESOURCES
008. I. Importance of SAE Programs A. Develops Responsibility B. Develops Skills C. Develops Personal Qualities D. Serves as a Source of Income E. Provides for FFA Advancement	1. Conduct a class discussion on importance of and values to be derived from SAE programs. 2. Conduct a tour of student SAE programs of class members. 3. Students write a paper on "Values Received From My First Year SAE Program."	State Program of Activities National FFA Publications
II. Expanding SAE Programs A. SAE Activities in Each Unit of Instruction B. Location of SAE Activities 1. Home 2. Business 3. School SAE Activities 4. Increasing Scope of SAE a. Financing b. Increased value 1. Educationally 2. Financially	1. List types of SAE and identify Horticulture SAE activities available. 2. Have students by groups determine other SAE activities at home, school, or in the school community. 3. Have each student review plans for beginning or increasing the scope and/or number of SAE activities. 4. Discuss benefits for increasing responsibility with SAE program.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 9 (1 HOURS) TEACHING UNIT TITLE: Supervised Agricultural Experience

COMPETENCY STATEMENT	TEST ITEM NO.
009. Make an inventory of assets and liabilities.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

009.1 Define inventory.

009.2 Define assets and liabilities.

009.3 Define and determine net worth of an individual.

CONTENT	TEACHING ACTIVITIES	RESOURCES
009. I. Make an Inventory	1. Have each student update their assets and liabilities in the record keeping system in use by the local Agricultural Education Program.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 10 (2 HOURS) TEACHING UNIT TITLE: Records and Financial Management

COMPETENCY STATEMENT	TEST ITEM NO.
010. Keep an up-to-date record book including expenses, receipts, work performed, and a financial statement.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

010.1 Have some type of written records on SAE program.

010.2 Periodically update the records.

010.3 Complete a financial statement at least once per year.

CONTENT	TEACHING ACTIVITIES	RESOURCES
010. I. SAE Record Keeping A. Types of Records for SAE Programs 1. Exploratory Visits 2. Production Projects 3. Work Experience-Agribusiness 4. Agriculture Co-op 5. Improvement Projects	1. List on chalkboard types of records needed for each type of SAE program. 2. Have students show records kept on past SAE projects. 3. Have students update SAE records periodically. 4. Each student should complete a financial statement for their SAE program at the end of the fiscal year.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 11 (2 HOURS) TEACHING UNIT TITLE: Computerized Record Keeping

COMPETENCY STATEMENT	TEST ITEM NO.
011. Use computerized record keeping and reporting system software.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

011.1 Be proficient at using computer software in record keeping.

CONTENT	TEACHING ACTIVITIES	RESOURCES
011. I. Computer Skills A. SAE Record Keeping B. Proficiency/American FFA Degree Programs C. Inventory Control 1. Equipment 2. Nursery Plants 3. Greenhouse Plants 4. Supplies	1. Have student complete activities necessary on some type of computer program.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 12 (2 HOURS) TEACHING UNIT TITLE: Entrepreneurship

COMPETENCY STATEMENT	TEST ITEM NO.
012. Describe entrepreneur license requirements.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

012.1 Describe the license requirements needed to begin a horticulture business.

CONTENT	TEACHING ACTIVITIES	RESOURCES
012. I. Types of Businesses A. Sole Proprietorship B. Partnership C. Corporation II. License Requirement to Operate a Business A. Local B. State C. Federal	1. Have students interview 2 people established in the horticulture business about requirements needed to begin a business. 2. Have local business people and local government officials talk to the student about beginning a business. 3. Have the students operate the greenhouse/nursery as a business.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 13 (3 HOURS) TEACHING UNIT TITLE: Customer Relations

COMPETENCY STATEMENT	TEST ITEM NO.
013. Identify customer relation techniques for working in the horticulture business including handling customer requests, objections, and complaints.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

013.1 Describe the relationship between the customer and employee.

013.2 Describe the image an employee should portray to a customer.

013.3 Be able to role play a situation in which a customer complaint is handled.

CONTENT	TEACHING ACTIVITIES	RESOURCES
013. I. Customer Relationships A. Customer Importance 1. Profit 2. Success B. Customer Image of Employee 1. First Impression 2. Lasting Impression C. Customer Behavior 1. Why People Buy a. value b. preference 2. Why People Do Not Buy D. Customer Complaints 1. Information Required a. name b. nature of complaints 2. Attitude of Employee a. appearance (1) smiling (2) compassionate (3) concerned b. reaction to complaint (1) positive (2) explanatory (3) concerned c. "listening" technique	1. Provide references for classroom study. 2. Invite manager of a horticultural business to speak to the class. 3. Visit horticultural business firms and discuss customer relations with various employees. 4. Role play situations where students practice handling customer complaints. 5. Role play situations where students practice creating "first" and "lasting" impressions. 6. Role play situations where students present examples of accepted employee dress and behavior versus unacceptable dress and behavior.	2, 19, 20, 31 34, 45, 46, 48,109

CONTENT	TEACHING ACTIVITIES	RESOURCES
3. Settlement of complaints a. fair to everyone concerned b. consistant		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 14 (3 HOURS) TEACHING UNIT TITLE: Marketing Horticultural Products

COMPETENCY STATEMENT	TEST ITEM NO.
014. Advertise and display items for sale in a horticulture business.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

014.1 Describe the purpose of advertising.

014.2 Describe the various advertising media.

014.3 Prepare a product display suitable for a horticulture business.

CONTENT	TEACHING ACTIVITIES	RESOURCES
014. I. Customer Information A. Advertising 1. Informs 2. Tells the truth 3. Has good taste 4. Socially responsible	1. Provide references for classroom study. 2. Visit businesses and observe "instore" advertising and customer flow patterns. 3. Invite business manager from a horticultural business to class for a discussion of advertising.	2, 19, 20, 31 34, 45, 46, 47, 109

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 15 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development.

COMPETENCY STATEMENT	TEST ITEM NO.
015. Identify principles of plant science as related to horticulture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

015.1 Identify the three applied plant sciences and their differences.

015.2 Identify the divisions of horticulture.

015.3 Define basic biological terms used to describe plants.

015.4 List examples of plants that fit given basic biological terms.

CONTENT	TEACHING ACTIVITIES	RESOURCES
015. I. Applied plant science A. Forestry 1. Timber production 2. Pulp B. Agronomy 1. Field crops 2. Forages C. Horticulture 1. Pomology 2. Olericulture 3. Ornamental a. Floriculture (1) cut flowers (2) pottted plants (3) foliage (4) bedding plants (5) floral design b. Trees and shrubs (1) shade trees (2) flower (3) fruit (4) foliage (5) bark	1. Use field trips to visit applied plant science industries 2. Have students visit a horticulture business and report what job skills are required and summarize what they observed.	14, 6, 7, 15, 16, 23, 5, 19,20, 32, 33, 34, 35, 41, 47, 50, 51, 56, 58, 61, 63, 65, 67, 69, 70, 73, 76, 77, 78, 88, 98, 99

CONTENT	TEACHING ACTIVITIES	RESOURCES
c. Turf grasses (1) golf courses (2) athletic facilities (3) industrial (4) residential d. Landscaping (1) improving home value (2) installation of walks, patio pools, etc. e. Nursery production (1) container (2) bare root (3) balled and burlapped f. Arboriculture (1) specialized tree care g. Seed production (1) specialiazed labor (2) genetics (3) areas of production II. Becoming acquainted with plants A. Terms and Examples 1. Herbaceous 2. Woody		

CONTENT	TEACHING ACTIVITIES	RESOURCES
3. Evergreen 4. Deciduous 5. Annual a. cool season b. warm season 6. Biennial 7. Perennial 8. Fruit 9. Pome 10. Drupe 11. Bramble 12. Small fruits 13. Vegetables a. root crops b. bulb crops c. tuber crops d. vine crops e. cold crops f. green crops 14. Ornamental plants a. annuals b. biennials c. perenials 15. Arboretum 16. Conservatory 17. Bedding plants 18. Foundation plants	1. Have students collect samples plants demonstrating characteristics discuss plant terms 2. Students prepare a list of five plants which are examples of each term. 3. Conduct a field trip to a conservatory or arboritum	

CONTENT	TEACHING ACTIVITIES	RESOURCES
19. Screening plants 20. Facer plants 21. Specimen plants 22. Bonsai		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 16 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development

COMPETENCY STATEMENT	TEST ITEM NO.
016. Describe the scientific relationship among horticultural plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

016.1 Discuss the scientific classification system.

016.2 Describe the distinguishing characteristics of gymnosperms and angiosperms.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 17 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development

COMPETENCY STATEMENT	TEST ITEM NO.
017. Explain the function and identify the anatomical parts and distinguishing characteristics of horticulture plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

017.1 Label the major parts of a plant.

017.2 Identify the anatomical parts and distinguishing characteristics of plants.

017.3 Describe the function of the major parts of the plant.

017.4 Describe the relationship between the functions of different parts of the plant.

017.5 Describe the relationship between plant growth and the environment..

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 18 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development

COMPETENCY STATEMENT	TEST ITEM NO.
018. Use computerized instructional programs.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

018.1 Identify plant parts.

018.2 Identify plant functions.

018.3 Study plant identification

CONTENT	TEACHING ACTIVITIES	RESOURCES
016. I. Anatomy of Plants (morphology) A. Plant Kingdom 1. Gymnosperms 2. Angiosperms 017. II. Plant Functions and Anatomy A. Stem 1. Function 2. Have nodes 3. Woody dicot stem a. xylem b. phloem c. cambium 4. Herbaceous dicot stem 5. Monocot stem 6. Modified stem a. tendril b. thorns c. tubers d. rhizomes e. corms f. bulb B. The Leaf 1. function 2. petiole	1. Collect and compare examples of gymnosperms and angiosperms. 2. Students label drawings of plant parts 3. Students label parts of the leaf on paper and/or on computer 4. Students label buds by position 5. Students label parts of a flower. 6. Have student dissect a flower indicating the name of each part and its function 7. Have students mount a cross section of a 1inch oak stem and a corn stalk labeling parts.	14, 54, 31

CONTENT	TEACHING ACTIVITIES	RESOURCES
3. stomates 4. chlorophyll 5. cutin 6. abscission C. The Bud 1. By position a. terminal b. lateral c. adventitious D. Flower 1. Function 2. Parts a. stigma b. style c. ovary d. anther e. filament f. petals or corolla g. sepals or calyx 3. Complete flowers 4. Incomplete flowers 5. Perfect flowers 6. Imperfect flowers a. monacious plants b. dioecious plants 7. Pollination 8. Fertilization		

CONTENT	TEACHING ACTIVITIES	RESOURCES
E. Fruit 1. Result of flower 2. Purpose - seed 3. Parthenocarpic plants F. Roots 1. Function 2. Without nodes 3. Root hairs		
018. I. Computerized Instructional Programs A. Review computer operations 1. Power on/off 2. Safe Handling of Software 3. Loading procedures	1. Assist students in operating the computer, having them demonstrate coorect hardware/software operating procedures	113-123
B. Use of Software 1. Identify plant parts 2. Identify plant functions 3. Study plant identification	2. Use Ortho's or Agri-ID plant identification software to study plant parts and identification.	117,119

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 19 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development

COMPETENCY STATEMENT	TEST ITEM NO.
019. Analyze the process of growth in horticulture plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

019.1 Compare and contrast the process of growth in horticulture plants.

019.2 Compare the phases of cell growth in plants.

019.3 Compare the stages of growth in plants.

019.4 Define how light, moisture, temperature, and nutrients affect a plant.

CONTENT	TEACHING ACTIVITIES	RESOURCES
019. I. Plant Growth Processes A. Photosynthesis B. Respiration C. Assimilation D. Absorption E. Transpiration F. Translocation	1. Demonstrate the effects of light on photosynthesis 2. Demonstrate respiration in plant materials 3. Demonstrate transpiration in plants 4. Demonstrate translocation in plants	14, 6, 31
II. Cell Growth A. Division B. Enlargement C. Differentiation	1. Use a microscope to observe different size cells	
III. Types of Plant Growth A. Apical dominance B. Lateral growth	1. Demonstrate the effects of pinching and disbudding on plants 2. Have students determine natural growth habit of several plants as related to apical and lateral growth	
IV. Stages of Growth A. Juvenile or vegetative B. Transition C. Production	1. Have students grow a pot mum and observe juvenile, transition, and production growth changes Keep data records on the plant	

CONTENT	TEACHING ACTIVITIES	RESOURCES
V. Plants and their Environment		
A. Temperature	1. List examples of cool season/warm season plants.	14, 6, 31
1. Cool season plants		
2. Warm season plants	2. Research house plants and describe those which are tropical in origin	
3. Tropicals		
4. Dormancy		
5. Hardiness Zones	3. Locate hardiness zones on a United States map	
B. Moisture		
1. Water utilization	4. Describe how water is used in each of the six growth processes	
2. Relation to growth process		
3. Reaction to abnormal water amounts	5. Conduct experiments showing the effects of too little and too much water	
C. Light		
1. Intensity		
2. Quality		
3. Photoperiod	6. Use a light meter to measure light intensity outside, in the greenhouse, in the lath house	
4. Phototrophism		
D. Nutrients		
1. Carbon, hydrogen, oxygen	7. Growing a pot mum, experiment with different lengths of daylight	
2. Primary macro nutrients		
3. Secondary macro nutrients	8. Using different nutrients, conduct experiments to demonstrate the effects of nutrients on plants	
4. Micro nutrients		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 20 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development

COMPETENCY STATEMENT	TEST ITEM NO.
020. Identify common horticultural plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

020.1 Identify 50% of the plants on the State FFA ID list.

CONTENT	TEACHING ACTIVITIES	RESOURCES
020. I. Plant Identification A. Naming Plants (taxonomy) 1. Venacular name 2. Botanical name a. genus b. species c. cultivar 3. Writing botanical names correctly B. Aids in Identifying Plants 1. General plant shape a. upright b. spreading 2. Stem a. one, many, vine b. herbaceous, woody c. smooth, rough, pubescent d. lenticels e. color 3. Flower a. color b. simple c. compound 1. spike 2. panicle	1. Have students identify the different characteristics (shape, stem, flower, leaves, buds) of 20 different plants. 2. Teach plant identification by covering 5 new plants each week until the end of year. Quiz weekly. 1. Use computerized programs to identify plant parts.	31 31, 15, 50 52, 56 117

CONTENT	TEACHING ACTIVITIES	RESOURCES
3. raceme 4. umbel 5. head 6. catkin		

CONTENT	TEACHING ACTIVITIES	RESOURCES
4. Leaves a. composition 1. simple 2. pinnately compound 3. bi-pinnately compound 4. palmately compound b. arrangement 1. alternate 2. opposite 3. whorled 4. basal c. margin 1. entire 2. undulate 3. crenate 4. serrate or toothed 5. lobed 6. cleft 7. dentate d. venation 1. parallel 2. palmate 3. pinnate e. color 1. top and underside 2. variagation		

CONTENT	TEACHING ACTIVITIES	RESOURCES
5. Buds a. color b. shape c. arrangement 6. Other taxonomic terms a. petiole b. pubescent c. glabious d. terrestrial e. epiphytic f. xerophytic g. phyllocades h. double flower i. single flower j. lenticel k. stipules l. sessile m. peltate n. macro o. micro p. alatus q. florus r. pendulus s. awls t. scales u. densi v. cuspis	3. Use these terms when appropriate to describe plants as new ones are learned.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 21 (35 HOURS) TEACHING UNIT TITLE: Plant Growth and Development

COMPETENCY STATEMENT	TEST ITEM NO.
021. Identify, describe and perform different methods of plant propagation.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

021.1 Identify different methods of plant propagation.

021.2 Describe advantages and disadvantages of different methods of propagation methods.

021.3 Propagate plants sexually and asexually using appropriate procedures.

CONTENT	TEACHING ACTIVITIES	RESOURCES
021. I. Plant Propagation A. Sexual propagation 1. Seed characteristics a. true to name b. free from disease and insects c. clean seed d. viable seed e. graded seed f. pelleted seed g. high energy seed 2. Plants never like parent plants 3. Conditions necessary for germination a. moisture b. oxygen c. temperature d. light e. nutrients f. media 4. Special Seed Treatments a. stratification b. scarification 5. Production of Plugs a. special equipment b. fertilization	1. Compare seed labels and analyze seed packet information. 2. Demonstrate viability of seed by performing a seed germination test. 3. Demonstrate water holding capacity of different media	14, 23, 31 47

CONTENT	TEACHING ACTIVITIES	RESOURCES
6. Transplanting a. two leaf stage b. watering 7. Labeling a name of student b. name of plant c. date	4. Transplant seedlings at appropriate time to cell paks. 5. Make labels for sown seed and transplanted plants	
B. Asexual Propagation 1. Reasons for asexual propagation 2. Methods a. leaf b. stem c. root d. layering e. grafting f. division g. separation h. tissue culture	1. Have students propagate plants by using different asexual methods	
3. Environmental Factors a. moisture b. light c. temperature d. humidity	2. Evaluate the influence of different environments on speed and percentage of rooted plants	

CONTENT	TEACHING ACTIVITIES	RESOURCES
4. Medias a. sand b. peat moss c. perlite d. mixes e. oasis, BH-8, Kys Kubes, Jiffy 7's	3. Evaluate different medias used in asexual propagation; investigate why some components are better than others	
5. Rooting Hormones a. purpose b. methods of application c. choosing right strengths	4. Demonstrate the effects of rooting hormone on a given species of plant	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 22 (35 HOURS) TEACHING UNIT TITLE: Role of Biotechnology

COMPETENCY STATEMENT	TEST ITEM NO.
022. Describe the role of biotechnology in horticulture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

022.1 Describe the relationship of biotechnology to horticulture.

CONTENT	TEACHING ACTIVITIES	RESOURCES
022. I. Define Biotechnology A. "bios" - "to live" "technology" - applied science	1. Write definition on chalkboard. 2. Have students write key words and definitions.	28
B. Biotechnology in Horticulture 1. Plant growth regulators 2. Producing disease resistant plants 3. Techniques to improve plant characteristics	3. Have students research and discuss biotechnology in horticulture.	18, 44

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 23 (35 HOURS) TEACHING UNIT TITLE: Role of Biotechnology

COMPETENCY STATEMENT	TEST ITEM NO.
023. Identify uses of biotechnology in horticulture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

023.1 List current ways biotechnology is being used in the horticulture industry.

CONTENT	TEACHING ACTIVITIES	RESOURCES
023. I. Current Issues A. Genetic Engineering B. Tissue Culture C. Plant Growth Regulators	1. Have students put together a paper model of recombinant DNA 2. Have students perform tissue culture techniques. 3. Have students determine the source of commericial plant growth regulators.	103, 108 51
II. Ethical Issues	1. Have students collect newspaper and magazine articles on biotechnology. 2. Discuss Biotechnology Policy - Public perception, Participation and the Law	44

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 24 (35 HOURS) TEACHING UNIT TITLE: Genetic Engineering

COMPETENCY STATEMENT	TEST ITEM NO.
024. Describe the use of applied genetics in horticulture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

024.1 Describe the methods of breeding used in developing plant varieties.

CONTENT	TEACHING ACTIVITIES	RESOURCES
024. I. Applied Genetics A. Classical B. Controlled 1. Mass selection 2. Inbreeding 3. Hybridization	1. Demonstrate a classical controlled breeding technique with flowering plants.	40
II. Molecular A. Polyploidy B. Genetic Engineeing	2. Discuss a fruit variety that is a polyploidy.	County Extension Agent

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 25 (35 HOURS) TEACHING UNIT TITLE: Scientific Methods

COMPETENCY STATEMENT	TEST ITEM NO.
025. Use scientific research methods to develop a paper and or project.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

025.1 Submit a report on an appropriate experiment or test of plant related studies.

CONTENT	TEACHING ACTIVITIES	RESOURCES
025. I. Biotechnology and Plants A. Genetic Engineering B. Tissue Culturing C. Chromosome Movement D. Disease Resistance E. Insect Resistance F. Herbicide Resistance G. Biological Pest Control H. New Cultivars of Plants	1. Students should conduct a short research of current biotechnology applications with plants and present the paper to the class	110, 111, 112
II. Plant Research Paper A. Scientific Method 1. Statement of the Purpose 2. Hypothesis 3. Procedure for testing 4. Variables 5. Controls 6. Observations 7. Results 8. Conclusions 9. Recommendations	2. Assist students in conducting an experiment studying plant growth using any plant and the scientific method; prepare a paper that includes all the scientific method steps	43

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 26 (6-8 HOURS) TEACHING UNIT TITLE: Soil Characteristics

COMPETENCY STATEMENT	TEST ITEM NO.
026. Identify and describe properties of soils used for horticultural plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

026.1 Identify and differentiate horticultural soils.

026.2 State at least 3 ways fertilizers improve crop production.

026.3 Identify the soil profile, soil structure, and soil texture of a given soil.

026.4 Measure the pH of a soil.

026.5 Identify the properties that make up a soil.

026.6 Indicate the difference between soils and soilless culture (hydroponics).

CONTENT	TEACHING ACTIVITIES	RESOURCES
026. I. Soil A. Importance B. Soil Horizon or Profile C. Characteristics of Soils 1. Make up a. water b. air c. organic material d. mineral material 2. Texture a. sand b. silt c. clay d. loam 3. Structure a. effect on growth b. improving soil structure 4. Pore Space a. soil water b. soil air 5. Soil pH a. pH scale b. changing pH D. Factors Affecting Soil 1. Temperature 2. Drainage	1. Provide references for classroom 2. Take a field trip to view soil profiles. 3. Have students differ soil texture by touch. 4. Let students note the differences between soil structures. 5. Demonstrate pore space by showing water movement through different soils. 6. Measure the pH of a given soil. 7. Test a soil and lime or sulfur according to recommendation. 8. Have student identify different types of organic and inorganic materials. 9. Conduct a demonstration of plants with and without mulches and compare the results. 10. Let students prepare a field for planting. 11. Let students mix soil for greenhouse use. 12. Have students prepare a compost pile. 13. Conduct demonstrations of the growth rate on plants in various soil and soilless media.	6, 31, 14, 47, 96

CONTENT	TEACHING ACTIVITIES	RESOURCES
3. Texture 4. Structure E. Soil Materials 1. Inorganic a. perlite b. vermiculite 2. Organic a. manure b. peat c. humus d. leaf mold e. straw, hay F. Mulches 1. Purpose 2. Types G. Soil Preparation 1. Field 2. Greenhouse 3. Compost Pile H. Soilless Culture 1. Purpose 2. Types 3. Economics		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 27 (4-6 HOURS) TEACHING UNIT TITLE: Soil Nutrients, and Fertilizers

COMPETENCY STATEMENT	TEST ITEM NO.
027. Identify describe and demonstrate proper use of nutrients used for horticultural plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

027.1 Differentiate between macro and micro nutrients.

027.2 Compare and contrast the different types of fertilizers.

027.3 Compute pounds of actual plant food in a bag of fertilizer.

027.4 Recognize macronutrient plant deficiencies.

027.5 Recognize difference between a chemical deficiency and an environmental deficiency.

027.6 Choose an appropriate method of applying fertilizer according to specific plant requirements.

CONTENT	TEACHING ACTIVITIES	RESOURCES
027. I. Nutrients A. Purpose B. Primary 1. Nutrients (N,P,K) 2. Deficiency symptoms C. Secondary 1. Nutrients (Ca, S, Fe) 2. Deficiency symptoms D. Micronutrients 1. Nutrients 2. Deficiency symptoms II. Fertilizers A. How Fertilizers Improve Production B. Inorganic 1. Complete 2. Incomplete C. Organic D. Analysis 1. Plant Food 2. Filler E. Types 1. Dry 2. Liquid 3. Slow Release F. Application 1. Dry	1. Provide references for classroom study. 2. Have students identify deficiency symptoms in plants. 3. Demonstrate growth in plants with various levels of nutrients. 4. Let students apply different types of fertilizers. 5. Compute pounds of plant food in a bag of fertilizer. 6. Have students identify different types of fertilizers. 7. Let students mix and apply fertilizer with hose-on. 8. Let students dissolve and prepare fertilizer for an injector. 9. Have students apply fertilizer to the leaves. 10. Let students plan and carry out a fertilization plan for the greenhouse.	6, 14, 31, 47 96, 92

CONTENT	TEACHING ACTIVITIES	RESOURCES
2. Liquid a. hose on b. injector c. spray d. leaf application 3. Slow Release		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 28 (2-4 HOURS) TEACHING UNIT TITLE: Soil Nutrients, and Fertilizers

COMPETENCY STATEMENT	TEST ITEM NO.
028. Take soil samples and describe utilization of results or findings.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

028.1 Analyze soil test report and make a recommendation.

028.2 Perform the correct steps in taking a soil sample from a designated area.

CONTENT	TEACHING ACTIVITIES	RESOURCES
028. I. Soil Test A. Purpose B. Steps in Taking II. Results A. Purpose B. Report Findings 1. pH 2. Nutrient levels C. Recommendation	1. Provide materials for classroom study. 2. Take soil samples. 3. Have students analyze the report findings. 4. Have students make a recommendation from the report.	6, 31, 14 47

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 29 (4-6 HOURS) TEACHING UNIT TITLE: Soil Mixes and Media

COMPETENCY STATEMENT	TEST ITEM NO.
029. Identify and describe the use of different soil mixes.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

029.1 Identify the most appropriate soil for various horticultural uses.

CONTENT	TEACHING ACTIVITIES	RESOURCES
029. I. Soil Mixes A. Types B. Economics	1. Provide references for classroom study. 2. Have students identify ingredients for soil mixes. 3. Have students mix soil for potting, rooting, and fine seed.	6, 14, 31 47, 100, 5

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 30 (4-6 HOURS) TEACHING UNIT TITLE: Soil Mixes and Media

COMPETENCY STATEMENT	TEST ITEM NO.
030. Recognize ingredients for the following media: (1) rooting, (2) potting, (3) fine seeded when given a choice of materials.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

030.1 Identify the characteristics of media for rooting, potting, and planting seed.

030.2 Be able to mix the media for a crop following a soil recipe.

CONTENT	TEACHING ACTIVITIES	RESOURCES
030. I. Media Characteristics A. Rooting B. Potting C. Fine Seed II. Soil Preparation A. Mixing B. Sterilization	1. Provide reference materials for classroom study. 2. Have students make different soil mixes and grow plants in each. 3. Let students sterilize soil using various methods.	5, 6, 14 31, 47, 100

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 11 (30 HOURS) TEACHING UNIT TITLE: Identification and Plant Pest Management

COMPETENCY STATEMENT	TEST ITEM NO.
031. Identify distinguishing characteristics of pest and growth cycles.	
032. Identify selected ornamental horticulture plant pests and prescribe the methods of control.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

031.1 Identify insect body parts.
031.2 Differentiate between chewing and sucking mouth parts.
031.3 Describe the life cycle of insects.
031.4 Describe the various plant disease categories.

032.1 Recognize plant damage caused by insects.
032.2 Recognize plant damage caused by fungi.
032.3 Recognize plant damage caused by bacteria.
032.4 Recognize plant damage caused by viruses.

CONTENT	TEACHING ACTIVITIES	RESOURCES
031-032. I. Common Features of Insects A. Legs B. Body Regions 1. Head 2. Thorax 3. Abdomen II. Identifying Insects A. Wings 1. Insects With No Wings a. chewing lice b. sucking lice 2. Insects With Wings a. Termites b. Mosquitoes B. Mouth Parts 1. Chewing a. Beetles b. Ants 2. Sucking a. Aphids b. Scale Insects C. Life Cycle of Insects	1. Provide references for classroom study. 2. Students bring in specimens of insects for identification and discussion. 3. Students collect insect samples representing features discussed in class. 4. Students mount insects collections.	6, 5, 31, 35 33, 42, 47, 53,64 4, 39

CONTENT	TEACHING ACTIVITIES	RESOURCES
1. Complete Metamorphosis a. Egg b. Larva c. Pupa d. Adult 2. Incomplete Metamorphosis a. Egg b. Nymph c. Adult		
III. Common Features of Plant Diseases A. Non-Parasitic Diseases 1. Nutritional Deficiencies 2. Extreme Cold and Heat 3. Environmental Pollutants 4. Mechanical Injury 5. Lack Of and Too Much Water B. Causes of Parasitic Plant Diseases 1. Fungi 2. Bacteria 3. Viruses 4. Nematodes C. Means of Transmitting Diseases 1. Soil 2. Water 3. Wind	1. Provide classroom references. 2. Students bring in specimens of plant diseases. 3. Compare and contrast parasitic and non-parasitic plant diseases.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
4. Seed 5. Vegetative Propagation 6. Mechanical 7. Insects		
IV. Common Features of Weeds A. Annual 1. Summer Annual 2. Winter Annual B. Biennials C. Perennials 1. Creeping Perennials-Bermuda 2. Simple Perennials-Plantain	1. Provide classroom references. 2. Students bring in specimens of weeds. 3. Students collect weed specimens. 4. Students mount weed specimen.	
V. Plant Pest Damage A. From Insects 1. Chewing 2. Sucking B. From Fungi 1. Powdery Mildew 2. Scab C. From Bacteria 1. Fire Blight 2. Leaf Spot D. From Virus 1. Mosaic	1. Provide classroom references. 2. Students bring in specimens of insects, fungi, bacteria, virus and weed damage. 3. Select one of the pest described above and prepare a report describing damage and appropriate control measures.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
E. From Weeds 1. Broadleaf 2. Narrowleaf VI. The N.C. Chemical Manual A. General Section B. Safety Section C. Application Section D. Insect Control Section E. Disease Control Section F. Chemical Weed Control Section	1. Provide classroom references. 2. Students study the organization of the N.C. Chemical Manual. 3. Given an insect disease or weed affecting a particular plant, students make recommendations for controlling the plant pest.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 32 (30 HOURS) TEACHING UNIT TITLE: Pest Control and Pesticide Safety

COMPETENCY STATEMENT	TEST ITEM NO.
033. Describe and perform alternative methods of pest control.	
034. Interpret chemical labels.	
035. Use agricultural chemical manual to determine the appropriate chemical for use.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

033.1 Describe some alternative methods of insect control.
033.2 Describe some alternative methods of plant disease control.
033.3 Perform (1) method of alternative insect control.
033.4 Perform (1) method of alternative plant disease controls.

034.1 Name the parts of a chemical label.
034.2 Recognize key signal words on chemical labels.
034.3 Determine whether a product is a fungicide, pesticide or herbicide.

035.1 Analyze table of contents in the pesticide manual.
035.2 Locate the appropriate section of the pesticide manual.
035.3 Interpret the appropriate section and recommend appropriate chemical for use.

CONTENT	TEACHING ACTIVITIES	RESOURCES
033. I. Natural Pest Controls A. Introduction of Natural Enemies of Insects 1. The Lady Bug 2. Praying Mantis B. Commercial Preparations Containing Disease Organism 1. Thuricide (Bacillus thuringiensis) 2. Talaromyces flavis II. Management Control Methods A. Integrated Pest Management Program 1. Using Natural Enemies of Pest 2. Plant Rotation Schedule 3. Chemical Control Related to Population Counts B. Crop Rotation C. Resistant Varieties D. Mechanical Controls 1. Electric Insect Traps 2. Liquid BaitTraps	1. Provide references for classroom study. 2. Compare and contrast the various alternative control measures. 3. Perform one method of alternative disease control. 4. Perform one method of alternative insect control. 5. Develop a science fair project promoting the concept of integrated pest management.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
034. I. Parts of the Chemical Label A. Brand Name B. Common Name C. Chemical Name D. Signal Words 1. Danger 2. Warning 3. Caution E. EPA Registration F. EPA Establishment Number G. Type of Formulation 1. Wettable Powers 2. Dust 3. Granules 4. Flowables 5. Soluble Powders 6. Baits 7. Emulsifiable Concentrates H. Hazard Statements I. Directions For Use J. Net Contents K. Classification Statement L. Storage and Disposal M. Name and Address of Manufacturer	1. Provide classroom samples for student references. 2. Using sample labels students identify the required parts of a chemical label. 3. Plan a field trip to a local business that sells both general and restricted chemicals. 4. Students prepare a list of the types of formulations found in the business visited. 5. Students contact local officials to determine methods of disposing of chemical containers. 6. Students contact N.C. Pesticide Board and report to class on the "Right to Know" regulations.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
II. Product Information A. Insecticide B. Miticide C. Acaricide D. Nematicide E. Fungicide F. Herbicide G. Rodenticide	1. Provide classroom references for students. 2. Using sample labels, students identify several chemical products.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
035. I. Organization of the N.C. Chemical Manual A. Table of Contents B. Index C. Sections of the Chemical Manual II. Using the Chemical Manual A. Recognition of Problem B. Locating Information C. Recommendations	1. Provide classroom references for students. 2. Students should practice using the manual to make recommendations for various chemical applications. 3. Given a particular need, students can use the manual to recommend a spray program.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 33 (30 HOURS) TEACHING UNIT TITLE: Pest Management

COMPETENCY STATEMENT	TEST ITEM NO.
036. Identify proper use of chemicals. 037. Determine type of pest(s) that the pesticide is designed to control when given labels from various commonly used pesticides. 038. Demonstrate safety precautions for handling and mixing pesticides when given various commonly used pesticides. 039. Demonstrate safe disposal and storage of pesticides when given surplus pesticides and containers.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

036.1 Determine mixing rates by reading the label.
036.2 Determine appropriate uses of a chemical.
036.3 Determine environmental dangers by reading label.

037.1 Interpret label and determine pest to be controlled.

038.1 Demonstrate the ability to safely mix pesticides.

039.1 Identify pesticides disposal sites in home county.
039.2 Describe safety procedures to follow when storing pesticides.
039.3 Describe safety procedures to follow when disposing of pesticide containers.
039.4 Describe environmental hazards associated with pesticide storage and disposal.

CONTENT	TEACHING ACTIVITIES	RESOURCES
036. I. Using Chemicals Properly A. Read Label B. Determine Mixing Rates C. Pest That May Be Controlled D. Environmental Hazards 1. Non-Target Organisms 2. Persistence and Accumulations 3. Pesticide Movement in the Environment	1. Students practice mixing chemicals using prepared labels and water. 2. Students plan a spray program for a crop. 3. Students cite possible environmental hazards associated with certain chemicals.	
037. I. Identification of Pesticides Disposal Sites A. County B. Region	1. Students contact county and regional landfills and inquire as to local regulations regarding pesticide disposal.	
038. I. Mixing Chemicals Properly A. Read Label B. Note Signal Word C. Note Formulation D. Dress Properly E. Use Accurate Measures F. Use Mask When Recommended	1. Students practice good chemical usage and safety precautions.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
039. I. Storage of Pesticides A. Requirements of Storage Area B. Selecting Storage Area C. Handling Containers in Storage Areas. D. Storage of Herbicides	1. Students make plan for proper storage of chemicals at home. 2. Students inventory chemicals found at home or farm. 3. Place chemicals in appropriate area.	
II. Disposal of Pesticide Containers A. Classification for Disposal of Empty Containers. 1. Burnable 2. Nonburnable 3. Containers With Inorganic Pesticides B. Rinsing Containers C. Methods of Disposal 1. Open Burning 2. Burial 3. Recycle 4. Incineration 5. Chemical Degradation 6. Soil Injection 7. Encapsulation	1. Students study labels to determine disposal category. 2. Students make a list of horticultural chemicals and how the container should be disposed.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 1 (2-5 HOURS) TEACHING UNIT TITLE: Greenhouse Equipment

COMPETENCY STATEMENT	TEST ITEM NO.
001. Describe selected functions of a greenhouse.	
002. Regulate greenhouse equipment to control temperature, light, and moisture.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

001.1 List several functions of the greenhouse.

001.2 Identify greenhouse environmental controls for heat, air, light, and moisture for various greenhouse crops.

002.1 List the major maintenance items and be able to perform such maintenance.

002.2 Draw plans for a greenhouse to meet the requirements of a specified crop.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 2 (10 HOURS) TEACHING UNIT TITLE: Greenhouse Equipment

COMPETENCY STATEMENT	TEST ITEM NO.
003. Identify maintenance items in connection with greenhouse management.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

003.1 Service and clean line strainers.

003.2 Clean and service fertilizer injectors.

CONTENT	TEACHING ACTIVITIES	RESOURCES
001.-003. I. Structures For Growing Plants A. Consideration of Plants Needs 1. Sunlight 2. Temperature 3. Moisture 4. Air Movement B. Greenhouses and Structures 1. Design 2. Size and Cost 3. Arrangement 4. Types of Material and Cost a. glass b. plastic c. fiberglass 5. Greenhouse Ventilation a. air movement b. exhausting c. cooling pads 6. Heating a. heating requirements in BTU's b. LP gas c. No. 2 fuel oil d. natural gas e. unit heaters f. maintenance	1. Provide references for classroom study. 2. Have each student prepare a study on how a greenhouse would be constructed to meet the needs of a specific plant crop and present to class. 3. Have students draw a typical greenhouse with appropriate dimensions and label. 4. Have students calculate the cost of constructing a greenhouse other than plastic. 5. Have each student develop a plan for constructing a plastic greenhouse of their own, have cost, and present to class. 6. Have students calculate heating and cooling needs for a greenhouse. 7. Take a field trip to a local greenhouse to see equipment. 8. Have students draw up a plan for the inside of a greenhouse showing bench and walkway placement.	33, 34, 35 69

CONTENT	TEACHING ACTIVITIES	RESOURCES
II. Management and Use of Greenhouse Equipment A. Greenhouse Benches 1. Usage to be made of 2. Height, width 3. Construction B. Beds 1. Usage to be made of 2. Width 3. Construction and drainage C. Time Clocks 1. Uses 2. Arrangements D. Solenoid Valves 1. Uses 2. Placement E. Line Strainers 1. Placement 2. Maintenance F. Mist Systems 1. Uses 2. Maintenance of nozzles G. Fertilizer Injectors 1. Types 2. Principles of operation 3. Calibration H. Watering Systems 1. Individual plant automatic watering systems	9. Have students draw a plan for a bed showing a cross-sectional view. 10. Have students adjust time clocks. 11. Have students disassemble and perform maintenance on line strainers. 12. Have students draw plans for mist operation. 13. Have students determine appropriate nozzle size for various rates of application. 14. Have students set up fertilizer injector, calibrate it, use it, and clean it. 15. Have each student put leaders on a plastic waterline. 16. Have each student demonstrate and practice setting up a moisture scale and watermatic valve. 17. Have the class make a pot collection. 18. Demonstrate to students and have them set up all greenhouse controls and check them daily.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
a. set-up b. maintenance 2. Moisture scale a. set-up b. maintenance 3. Spray stakes a. set-up b. maintenance	19. Demonstrate general greenhouse maintenance procedures and have students perform these operations. 20. Have each student check the school greenhouse during the year once each day for 14 days, including weekends, and perform any needed operation.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 3 (2-3 HOURS) TEACHING UNIT TITLE: Bedding Plan Production

COMPETENCY STATEMENT	TEST ITEM NO.
004. Identify selected bedding plants according to growth habit and use.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

004.1 Identify at least ten bedding plants according to growth habit and use.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 4 (1-2 HOURS) TEACHING UNIT TITLE: Bedding Plant Production

COMPETENCY STATEMENT	TEST ITEM NO.
005. Identify several problems related to growing bedding plants.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

005.1 List and solve three problems connected with growing bedding plants.

005.2 List and put into use principles involved in growing bedding plants.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 5 (6-8 HOURS) TEACHING UNIT TITLE: Bedding Plant Production

COMPETENCY STATEMENT	TEST ITEM NO.
006. Seed bedding plants in hot bed or seed flat.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

006.1 Construct and purchase seed flat containers for sowing bedding plant seed.

006.2 Follow recommended procedures for sowing seed using seed sowers, plastic covers, and several types of seed media.

006.3 Prepare a seeding schedule.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 6 (10 HOURS) TEACHING UNIT TITLE: Bedding Plant Production

COMPETENCY STATEMENT	TEST ITEM NO.
007. Prepare media and transplant bedding plants to appropriate containers.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

007.1 Grow a crop of bedding plants.

007.2 Use several types of media for growing bedding plant crops.

CONTENT	TEACHING ACTIVITIES	RESOURCES
004.-007. I. Growing Annual and Bedding Plants A. Market Needs 1. What people will need 2. Interpreting last year's production 3. New plants and varieties B. Plant Procurement 1. Seed a. ordering b. scheduling sowing dates c. germinating seed 2. Pregerminating plants a. ordering 3. Transplanting a. method b. timing C. Soil 1. Mixes a. U.C. b. soil-sand-peat c. soil-peat d. soil-sand e. sand-peat f. soiless mixes D. Containers	1. Provide references for classroom study. 2. Have students take a field trip to a local garden center to discuss market needs in bedding plants. 3. Have students make out an order sheet for seed. 4. Have students plan sowing dates and transplant dates for a crop to be ready to sell to a customer on a given date. 5. Have students make a list of plants that can be bought pregerminated. 6. Have students plant a specific crop in each type of soil mix to observe differences. 7. Have students conduct a study of fertilization methods on a specific plant. 8. Have the class make a collection of different containers. 9. Have students grow marigolds, zinnias, petunias, etc. for planned sales.	5, 19, 20, 32 33, 47, 60

CONTENT	TEACHING ACTIVITIES	RESOURCES
1. Packs a. peat pots b. thin-walled plastic packs 2. Pots a. peat pots b. plastic pots c. clay pots d. other commonly prepared pots E. Watering and Feeding a. manual b. automatic 2. Fertilizing a. injection b. liquid application F. Growth Retardants 1. Uses 2. Types 3. Effects G. Production 1. Temperature a. 50^{o} F b. 60^{o} F 2. Light 3. CO_2 4. Insects-disease 5. Cost of production 6. Advertising	10. Have each student water bedding plants by hand. 11. Have each student set up an automatic watering system. 12. Have each student set up and use a fertilizer injector. 13. Have class use different growth retardants on plants and study the results. 14. Have students keep accurate records on the cost of a specific crop. 15. Have students plan the advertising needed to sell a crop. 16. Have students take orders, deliver, and sell bedding plants.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 7 (1-2 HOURS) TEACHING UNIT TITLE: Potted Plant Production

COMPETENCY STATEMENT	TEST ITEM NO.
008. Operate and maintain lighting and shading systems to provide optimum conditions when given a specific variety of floral crops and an equipped greenhouse.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

008.1 Produce a crop of pointsettias or other pot plant.

008.2 Control quality and quantity of light in growing floral plants.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 8 (20 HOURS) TEACHING UNIT TITLE: Potted Plant Production

COMPETENCY STATEMENT	TEST ITEM NO.
009. Operate and maintain automatic watering systems and hand water potted bench and bed grown crops according to specified procedures when given floral crops to be grown in an equipped house.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

009.1 Regulate and service an automatic watering system.

009.2 Recognize the difference in water requirements of plants grown in clay, plastic, and peat containers

009.3 Recognize the importance of watering bench crops and pots to have good "run-through."

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 9 (3 HOURS) TEACHING UNIT TITLE: Potted Plant Production

COMPETENCY STATEMENT	TEST ITEM NO.
010. Construct a hanging basket using appropriate horticultural materials.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

010.1 Recognize several type and sizes of hanging basket containers.

010.2 Utilize flowering and foliage plants to construct a hanging basket.

CONTENT	TEACHING ACTIVITIES	RESOURCES
008.-010. I. Potted Plant Production A. Plant Procurement 1. Cutting a. ordering and scheduling b. handling cuttings c. deliveries d. delay and loss procedure 2. Bulbs a. ordering b. storing B. Pots 1. Types (clay, plastic, etc.) 2. Sizes 3. Names 4. Cost C. Soils 1. Mixes a. U.C. b. mineral soil-peat-sand c. mineral soil-sand d. mineral soil-perlite e. pH f. fertilizer g. sterilization h. soil testing D. Planting 1. Timing	1. Provide references for classroom study. 2. Have students order plants to use during the study. 3. Have students plan a crop of potted plants to grow. 4. Have students order bulbs for use. 5. Have class make a collection of pots to learn types and sizes. 6. Have students mix soil for growing potted plants. 7. Have students sterilize soil to use. 8. Have students grow the same plant in different soil mixtures to show their effect on plant growth. 9. Have students properly set plants in pots. 10. Have each student plan pot placement for maximum quality plants 11. Have students pinch plants to be grown.	5, 19, 20, 32 33, 47, 67, 74

CONTENT	TEACHING ACTIVITIES	RESOURCES
2. Number of plants per pot 3. Spacing and setting of plants 4. Spacing of pots E. Pinching 1. Function 2. Methods F. Growth Retardants 1. Types 2. Names 3. Purpose of Use G. Disbudding H. Control of Environment 1. Biological need of individual plant 2. Lighting 3. Black cloth 4. Timing of crop bloom 5. Temperature I. Watering 1. Effects of watering on leaves 2. When to water 3. Importance of water to crop 4. Methods a. automatic plant waterer b. individual plant watered by hand 5. Fertilizer a. through water b. methods and equipment	12. Have students use growth retardant on some plants and not on others to show effect. 13. Have students disbud crop. 14. Have students set up lighting system needed. 15. Have students black cloth plants as needed. 16. Have each student water plants by hand. 17. Have each students mix liquid fertilizer and use it on potted plants. 18. Have students develop a preventative insect and disease plan and put it to use.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
J. Disease and Insects 1. Prevention 2. Eradication 3. Programs 4. Effects		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 10 (20-23 HOURS) TEACHING UNIT TITLE: Landscape Design and Interiorscaping

COMPETENCY STATEMENT	TEST ITEM NO.
011. Describe a landscape plan and its use. 012. Create a landscape plan for a house and grounds and/or commercial application.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

011.1 Identify occupational opportunities in landscaping.
011.2 Establish and maintain a landscape.
011.3 Identify the different type of plans used in landscaping.

012.1 Write specifications for a landscape plan.
012.2 Identify proper layout of plant materials in landscaping.
012.3 Identify the tools and steps to follow in developing a plan.
012.4 Identify the areas of landscape and their uses.
012.5 Design a landscape plan of a selected area.
012.6 Identify the symbols used on a landscape plan.

CONTENT	TEACHING ACTIVITIES	RESOURCES
012. I. Landscape Design A. Areas of the Landscape 1. Public Area a. Purpose b. Style of Planting 1. formal 2. informal c. Foundation Planting 1. height of plants 2. doors and windows 3. wing plantings d. Framing the House 1. purpose 2. tree location 3. choosing a tree e. Lawns 1. enclosures 2. drives 3. walks 2. Family Living Area a. Purpose b. Privacy 1. plants 2. fences c. Socialization 1. traffic patterns 2. light requirements 3. sports activities	1. Provide references for classroom study. 2. Let students collect magazine clippings of good public, private, and service areas. 3. Visit public buildings to observe landscape design. 4. Take a field trip to local homes discussing landscape possibilities. 5. Have students list things to be considered in landscaping. 6. Have students develop a model landscape project on paper with a key. 7. Construct a model of an earlier drawn landscape. 8. Observe references on landscape design.	6, 9, 24, 25 26, 27, 36 61, 70, 72 73, 82, 83

CONTENT	TEACHING ACTIVITIES	RESOURCES
011. I. Landscaping Occupations A. Types B. Training/Education C. Salary II. Landscaping Plan A. Definition B. Importance C. Involves 1. Design 2. Selection a. plants b. man made materials 3. Maintenance D. Plans 1. Site Analysis 2. Planting 3. Elevation	1. Provide reference materials for classroom study. 2. Arrange for a field trip to a local landscaping firm. 3. Arrange for a field trip to a local landscape education agency. 4. Have student do a study of landscaping needs in the community. 5. Visit or interview a local landscape designer.	6, 9, 31, 36 24, 88

CONTENT	TEACHING ACTIVITIES	RESOURCES
4. children's activities 5. special needs (pools etc.) d. Patios or Decks 1. style 2. traffic patterns 3. size/use e. Other Structures 1. furniture 2. statues 3. Private Living Area a. Purpose b. Privacy 1. plants 2. fences 4. Service Area a. Purpose b. Location 1. kitchen 2. garage c. Screening 1. plants 2. fences B. Outdoor Room 1. Walls a. Definition b. Location		

CONTENT	TEACHING ACTIVITIES	RESOURCES
2. Ceilings a. Definition b. Types 1. plants 2. buildings 3. Floors a. Definition b. Types 1. plants 2. man made C. Principles 1. Harmony 2. Simplicity 3. Balance 4. Unity 5. Proportion and Scale 6. Repetition, Rhythm and Sequence 7. Focalization 8. Color 9. Composition II. Drawing the Landscape Plan A. Drawing Equipment 1. Triangle 2. Scale 3. T-Square		

CONTENT	TEACHING ACTIVITIES	RESOURCES
4. Drawing Board 5. Pencils 6. Tape 7. Eraser shield B. Drawing to Scale 1. Architect's Scale 2. Engineer's Scale C. Blueprint Reading 1. Symbols 2. Scales 3. Keys		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 11 (6-9 HOURS) TEACHING UNIT TITLE: Landscape Design

COMPETENCY STATEMENT	TEST ITEM NO.
013. Render a landscape plan using appropriate materials.	
014. Develop a competitive bid for a landscape plan.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

013.1 Identify the different media used to render a plan.
013.2 Describe the importance of a rendered plan.
013.3 Render a completed landscape plan.

014.1 Write a bill of materials needed from a landscape plan.
014.2 Figure the cost of plan, including labor.
014.3 Present the bid, with an explanation of items, to the contact person.

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CONTENT	TEACHING ACTIVITIES	RESOURCES
013. I. Rendering A. Purpose B. Importance C. Media 1. Chalk 2. Markers 3. Pencils D. Techniques 1. Coloring 2. Shading II. Practice/Final Plan	1. Provide reference materials for classroom study. 2. Have students practice using the various types of media. 3. Let students render their completed landscape plan.	24, 25, 27 36

CONTENT	TEACHING ACTIVITIES	RESOURCES
014. I. Bids in Landscaping A. Purpose B. Relationship II. Writing a Bid A. Bill of Materials 1. Contents a. plants b. man made materials c. mulches d. special structures 2. Pricing a. wholesale b. retail B. Labor 1. Workers 2. Resource People a. office help b. part-time C. Presenting Bid	1. Provide reference materials for classroom study. 2. Visit a landscaper and learn why and how to construct a bid. 3. Have students develop a bid from a landscape plan. 4. Calculate the amount and cost of labor needed on a plan. 5. Present the final bid and plan to the class.	24, 25, 27, 36

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II
TEACHING UNIT NO. 12 (4-6 HOURS) TEACHING UNIT TITLE: Landscape Design

COMPETENCY STATEMENT	TEST ITEM NO.
015. Use CAD/CAM programs to develop landscape plans.	
016. Describe the importance of interior landscaping.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

015.1 Use programs to develop landscape plans on the computer.

016.1 Identify where interior landscaping is used.
016.2 Identify the objectives of interior landscaping.
016.3 Relate the similarities and differences between exterior and interior landscaping.
016.4 Identify occupational opportunities in interior landscaping.
016.5 Identify the problems associated with interior landscaping.

CONTENT	TEACHING ACTIVITIES	RESOURCES
015. I. CAD/CAM A. Purpose B. Importance C. Uses	1. Provide reference materials for classroom study. 2. Develop a plan using the CAD/CAM system.	116

CONTENT	TEACHING ACTIVITIES	RESOURCES
016. I. Interiorscaping Opportunities A. Types B. Training/Education C. Salary II. Interiorscaping A. Definition B. Importance C. Involves 1. Design 2. Selection a. plants b. man made materials 3. Maintenance D. Plans 1. Site Analysis 2. Planting 3. Elevation III. Principles of Interiorscaping A. People Involvement B. Functions of Plants C. Formal or Informal D. Characteristics of Plants 1. Color 2. Shape 3. Texture	1. Provide references for classroom use. 2. Visit areas of interiorscaping and note the design principles used. 3. Have students cut out pictures of good interiorscapes from magazines and present to the class. 4. Invite an interiorscaper to talk to the class about the job opportunities. 5. Have students illustrate the differences between exterior and interior landscaping.	10, 24, 25, 27, 36, 21

CONTENT	TEACHING ACTIVITIES	RESOURCES
4. Fragrance 5. Size 6. Longevity E. Design Principles 1. Harmony 2. Simplicity 3. Balance 4. Unity 5. Proportion and Scale 6. Repetition, Rhythm and Sequence 7. Focalization 8. Color		

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 13 (24-28 HOURS) TEACHING UNIT TITLE: Landscape Design

COMPETENCY STATEMENT	TEST ITEM NO.
017. Identify those plants that will fit the space in interiorscaping.	
018. Create and interior plan for a shopping center or other specified facility.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

017.1 Given a plan, identify which plants will fit the space.
017.2 List the special requirements of plants that are used in interiorscaping.

018.1 Write specifications for an interior landscape plan.
018.2 Identify proper layout of plant material in interior plan.
018.3 Design an interior plan of a specified area.
018.4 Identify the tools and steps to follow in developing a plan.
018.5 Present plan to interested party.

CONTENT	TEACHING ACTIVITIES	RESOURCES
017. I. Interior Plants A. Special Requirements 1. Light 2. Temperature 3. Water 4. Air 5. Humidity 6. Space B. Plants Used 1. House Plants 2. Exterior Plants	1. Provide references for classroom study. 2. Conduct experiments that reflect the plants need for water, light, temperature,etc. 3. Learn different plants that are commonly used in interiorscaping.	10, 24, 25,27, 36, 22, 65, 67, 21

CONTENT	TEACHING ACTIVITIES	RESOURCES
018. I. Interiorscaping A. Tools 1. Triangle 2. Scale 3. T-Square 4. Pencils 5. Tape 6. Erasing Shield B. Design Plan 1. Layout 2. Plants Used 3. Special Requirements	1. Provide references for classroom study. 2. Have students become familiar with the tools and their uses. 3. Let students design an interiorscape for a specified area.	10, 24, 25,27, 36, 22, 65, 21 67
II. Specifications A. Materials 1. Plants 2. Man Made B. Labor 1. Installation 2. Maintenance C. Presenting Bid	1. Provide references for classroom study. 2. Have students develop a bid for their interiorscape project. 3. Have student present the bid and plan to an interested party.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 14 (15 HOURS) TEACHING UNIT TITLE: Landscape Maintenance

COMPETENCY STATEMENT	TEST ITEM NO.
019. Plant or transplant selected ornamental plants. 020. Plant different types of bulbs. 021. Identify proper methods of maintenance and care of plants after planting. 022. Demonstrate the recommended method of watering newly planted stock when given newly planted landscape plants and trees.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

019.1 Demonstrate procedures for planting bare root plants.
019.2 Demonstrate procedures for planting container grown plants.
019.3 Demonstrate procedures for planting burlapped plants or trees.

020.1 Plant bulbs in a landscape appropriately.

021.1 Prepare a maintenance schedule for newly planted shrubs and trees.
021.2 Prepare a maintenance plan for newly planted annuals and perennials.
021.3 Care for newly planted, shrubs, trees, perennials and annuals.

022.1 Demonstrate the proper method for watering newly planted trees and shrubs.

CONTENT	TEACHING ACTIVITIES	RESOURCES
019.		
I. Planting Bare Root Plants	1. Provide references for classroom study.	6, 8, 22, 26
A. When To Plant		31, 47, 71
B. How To Plant	2. Students plant bareroot nursery stock.	75, 53
C. Watering		
D. Fertilizing	3. Students write planting specifications.	21, 13, 57, 29
E. Mulching		
F. Pruning	4. Visit a local garden center or nursery and note different types of nursery stock being sold.	
II. Planting Container Grown Plants	1. Students plant container grown plants.	
A. When To Plant		
B. Removal of Containers	2. Students write planting specifications.	
C. How To Plant		
D. Watering		
E. Fertilizing		
F. Mulching		
G. Pruning		
III. Planting Burlapped Plants	1. Students plant burlapped plants.	
A. When To Plant		
B. How To Plant	2. Students write planting specifications.	
C. Watering		
D. Fertilizing		
E. Mulching		
F. Pruning		

CONTENT	TEACHING ACTIVITIES	RESOURCES
020. I. Planting Bulbs A. When To Plant B. Soil Preparation C. How To Plant D. Fertilizing E. Care After Flowering F. Forcing Bulbs	1. Visit a local garden center and rate what type of bulbs are available. 2. Build a cold frame for growing and producing bulbs. 3. Design a flowerbed and plant spring and fall bulbs. 4. Prepare a bulletin board or chart illustrating different bulbs.	9, 14

CONTENT	TEACHING ACTIVITIES	RESOURCES
021. I. Care of Newly Planted Trees and Shrubs. A. Fertilizing B. Watering C. Training D. Staking and Guying E. Weather and Animal Protection II. Maintenance Schedule For Plants A. Watering B. Fertilization C. Pruning D. Insect Control (Prevention) E. Disease Control (Prevention) F. Pruning	1. Students care for plants after they are planted. Should include watering, fertilizing, mulching, pruning, and training. 2. Provide classroom references. 3. Students select a particular plant and prepare a schedule of activities that will promote appropriate growth.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
022. I. Watering Newly Planted Trees and Shrubs A. Water Losses B. Purpose for Watering C. Watering the Finished Shrub. D. Watering the Finished Tree.	1. Students prepare a chart or drawing illustrating proper watering techniques. 2. Students illustrate construction of a basin for watering a newly planted tree.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II
TEACHING UNIT NO. 15 (15 HOURS) TEACHING UNIT TITLE: Landscape Soil Preparation and Plant Maintenance

COMPETENCY STATEMENT	TEST ITEM NO.
023. Explain how to sterilize soil with methyl bromide or other chemicals for planting beds.	
024. Prune different kinds of ornamental plants.	
025. Demonstrate the procedures for removing and/or repairing the injury when given an injured tree or shrub.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

023.1 Demonstrate procedures for sterilizing soil using chemicals.
023.2 Describe safety practices to be observed.

024.1 Compare and contrast the principles of the different types of pruning.
024.2 Identify pruning tools and supplies.
024.3 Compare and contrast the effects of pruning on various plants.
024.4 Identify the seasons to prune various plants.

025.1 Prune an evergreen shrub.
025.2 Prune a deciduous shrub.
025.3 Perform corrective pruning on a damaged tree or shrub.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 16 (90 HOURS) TEACHING UNIT TITLE: Landscape Maintenance: Pruning and Planting

COMPETENCY STATEMENT	TEST ITEM NO.
026. Perform corrective pruning procedures to develop a more balanced and compact appearance when given an odd shape shrub.	
027. Shear to maintain a thick and compact growth which will match the desired conformation when given a formal hedge, and the intended conformation.	
028. Espalier an ornamental plant.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

026.1 Perform corrective pruning on an odd-shaped plant.

027.1 Shear a formal hedge plant to the satisfaction of the teacher.

028.1 Select a plant appropriate for espaliering.
028.2 Espalier a plant.

CONTENT	TEACHING ACTIVITIES	RESOURCES
023.-028. I. Sterilizing The Soil A. Chemicals Appropriate For Use 1. Effect on The Soil 2. Safety Measures B. Non Chemical Sterilization	1. Students determine proper chemicals for soil sterilization by using the N.C. Chemical Manual. 2. Students list safety measures that should be followed. 3. Students determine licensing requirements for using chemicals.	
II. Pruning Evergreen And Deciduous Shrubs A. Evergreen Shrubs 1. How Much Pruning Needed 2. When To Prune a. Slow Growing Shrubs b. Fast Growing Shrubs B. Deciduous Shrubs 1. When To Prune 2. Renewing Old Plants 3. Shaping Plants C. Roses 1. Amount To Prune 2. When To Prune 3. Base Shoots And Suckers 4. Cutting Blossoms	1. Provide classroom references. 2. If feasible, students prune at least one specimen of all species of plants available. 3. Use appropriate audiovisual resources.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
D. Rhododendrons and Azaleas 1. When To Prune 2. Renewing Old Plants 3. Shaping Plants E. Ornamental Trees 1. Broadleaf Trees a. how much pruning necessary b. when to prune c. where to make cuts F. Coniferous Evergreens 1. How much Pruning 2. Where to Prune 3. Where to Make Cuts G. Ornamental Vines 1. How Much to Prune 2. Where To Prune		
III. Root Pruning A. Why Root Prune B. How To Prune Roots C. How much Pruning is Necessary	1. Provide classroom references. 2. Students observe plants which have been root pruned previously to observe results. 3. Students root prune shrubs.	
IV. Pruning and Training for Special Purposes A. Topiary B. Espaliering C. Hedges	1. Provide references for classroom study. 2. Have students list the plants that can be pruned for special purposes.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
D. Shearing E. Pollarding	3. Have students observe plants that have been pruned and trained. 4. Students espalier a pyracantha	
V. Pruning Tools A. Hedge Shears 1. Electric 2. Gas Operated 3. Hand Operated B. Hand Pruners C. Lopping Shears D. Pole Pruners	1. Students identify different types of pruning tools. 2. Students use or demonstrate the use of various pruning equipment. 3. Students cite safety rules regarding the use of pruning equipment.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 17 (15 HOURS) TEACHING UNIT TITLE: Landscape Maintenance and Weed Control

COMPETENCY STATEMENT	TEST ITEM NO.
029. Identify weeds growing in ornamental plants and recognize and construct appropriate procedures and processes necessary for controlling the weeds.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

029.1 Identify common weeds.

029.2 Locate and recommend chemical controls.

029.3 Recommend natural controls.

CONTENT	TEACHING ACTIVITIES	RESOURCES
029. I. Common Weeds A. Broadleaf B. Narrowleaf C. Growth Habits II. Chemical Weed Control A. Using the N.C. Chemical Manual B. How Chemical Weed Controls Work C. Time of Application 1. Preplant 2. Preemerge 3. Postemerge III. Natural Weed Controls A. Mulch 1. Straw 2. Bark a. Nuggets b. Mini Nuggets c. Shredded Hardwood B. Fiberglass Covering C. Stones	1. Provide references for classroom study. 2. Students bring weed samples to class for identification. 3. Students using the N.C. Chemical Manual locate and recommend chemicals for controlling certain weeds. 4. Students mix and spray a herbicide on a particular weed area. 5. Using small amounts of herbicide, apply and record the effects on a particular plant. 6. Students develop a fair as science project illustrating the different herbicides. 7. Students study herbicide labels. 8. Students visit a garden center and observe the various natural weed controls.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 18 (15 HOURS) TEACHING UNIT TITLE: Landscape Equipment Care and Safe Operation

COMPETENCY STATEMENT	TEST ITEM NO.
030. Safely operate and maintain landscape equipment changing oil and oil filters and service all areas needing lubrication.	

INSTRUCTIONAL OBJECTIVES: Upon comple ion of this unit, the student will be able to:

030.1 Identify the parts on a small engine that require lubrication.

030.2 Drain oil and refill crankcase to the proper level using oil prescribed by the operators manual.

030.3 Change oil filters.

030.4 Select correct lubricating material and lubricate all service areas.

CONTENT	TEACHING ACTIVITIES	RESOURCES
030. I. Lubrication A. Service Areas B. Oil Changes C. Lubricating Materials 1. Oil 2. Grease	1. Students prepare a maintenance schedule for a small engine using the operators manual. 2. Students identify the areas on a small engine that require servicing. 3. Students compare the lubricating properties of oil and grease.	
II. Air Cleaner Service A. Types of Cleaners 1. Oil Bath 2. Oil Filter 3. Dry Filter B. Cleaning Materials	1. Students service the air cleaners of a small engine at home.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 19 (5 HOURS) TEACHING UNIT TITLE: Floral Design Products and Materials

COMPETENCY STATEMENT	TEST ITEM NO.
031. Identify selected flowers, plants, and materials used in floral arrangement.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

031.1 Identify common flowers, fillers, and greenery used in floral design.

031.2 Identify flowering potted plants used in the florist industry.

031.3 Identify foliage plants used in the florist industry.

031.4 Identify materials used in floral design work.

CONTENT	TEACHING ACTIVITIES	RESOURCES
031. I. Flower Identification A. Alstroemeria B. Amaryllis C. Anthurium D. Bird-of-Paradise E. Calla Lily F. Carnation G. Chrysantheum H. Daffodil I. Dutch Iris J. Freesia K. Gladiolus L. Gardenia M. Gerbera Daisy N. Liatris O. Orchid P. Rose Q. Snapdragon R. Stock S. Tulip II. Fillers A. Heather B. Gypsophila C. Stephanotis D. Statis E. Yarrow	1. Have students make a pictorial identification list of all flowers. 2. Use as many of the flowers as possible in design work. 3. Visit a wholesale floral supplier.	2, 45, 46, 62 65, 66, 67, 80 93, 94, 109

CONTENT	TEACHING ACTIVITIES	RESOURCES
III. Greenery Identification A. Camellia B. Eucalyptus C. Galax D. Huckleberry E. Ivy F. Jade G. Leatherleaf Fern H. Pittsporum I. Plumosus Fern J. Sprengeri Fern IV. Flowering Potted Plants A. African violet B. Azaleas C. Christmas cactus D. Chrysanthemum E. Cyclamen F. Easter lily G. Geranium H. Gerbera Daisy I. Gloxinia J. Hibiscus K. Hydrangea L. Kalanchoe M. Peace lily N. Poinsettia O. Primula	1. Have students make a pictorial identification list of all plants. 2. Use as much of the foliage as possible in design work. 3. Visit a wholesale floral supplier.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
V. Foliage Plants A. Arbicola/Dwarf Schefflera B. Boston fern C. Chinese evergreen D. Corn plant E. Croton F. Dieffenbachia (Dumbcane) G. Emerald Ripple Peperomia H. Golden Pothos I. Grape ivy J. Norfolk Island pine K. Philodendron L. Red-margin dracaena M. Rubber plant N. Schefflera O. Spider plant P. Swedish ivy Q. Weeping or Benjamin fig		
VI. Materials Identification A. Containers 1. Vases 2. Bowls 3. Baskets 4. Specialized Holders B. Floral Foam C. Tape	1. Allow students to use as many of the materials as possible in design work.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
D. Accessories 1. Ribbon 2. Picks a. wooden b. steel c. water 3. Wire 4. Chenille Stem 5. Corsage Pins 6. Corsage Boxes/Bags 7. Greening Pins 8. Candle Holders 9. Cards 10. Card Holders 11. Wreaths/Holders 12. Floral Preservative E. Tools 1. Floral Knife 2. Ribbon Shears 3. Pruning Shears 4. Wire Cutters 5. Glue Gun 6. Pick Machine 7. Flower Cutter		

CONTENT	TEACHING ACTIVITIES	RESOURCES
VII. Flowers and Their Lasting Quality A. Age and Stage of Development B. Harvest C. Conditioning, Warm Water, Refrigeration D. Flower Preservatives E. Temperature and Drafts	1. Have students process cut flowers and prepare them for refrigeration.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 20 (8 HOURS) TEACHING UNIT TITLE: Floral Design and Marketing

COMPETENCY STATEMENT	TEST ITEM NO.
032. Make at least two of the following arrangements to satisfaction of the instructor or employer when given adequate plant materials, containers, and accessories. a. Center piece b. Hospital arrangement c. Corsage d. Basket e. Wedding Bouquet	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

032.1 Be able to make a specified floral arrangement and prepare a price sheet for that arrangment given adequate plant materials, containers, and accessories.

CONTENT	TEACHING ACTIVITIES	RESOURCES
032. I. Introduction A. Floral Design and Modern Living B. Flowers in the home and workplace C. Flowers for Special Purposes 1. Church 2. Parties 3. Hospital 4. Funerals 5. Flower Shows 6. In the Media	1. Write down at least five situations in which flowers were used. 2. Write down your reaction to the flowers used in each situation.	
II. The Art of Floral Arrangements A. Color 1. Hues, Tones, Tints, Shades 2. Primary Color 3. Secondary Color 4. Tertiary Color B. Basic Design 1. Straight Line 2. Mass 3. Triangle 4. Circle 5. Curved Line	3. Have students make line drawings of basic floral designs. 4. Have students make floral designs specified by the instructor.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
C. Basic Principles 1. Balance a. symmetry b. stability c. depth 2. Scale 3. Proportion 4. Rhythm 5. Harmony a. repetition b. unity 6. Emphasis a. Contrast b. Dominance		
III. Corsages/Boutonnieres A. Wearing Styles B. Selection of Flowers/Foliage C. Ribbon and other Accessories D. Lasting Qualities E. Packaging	5. Have students make corsages specified by the instructor.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 21 (2 HOURS) TEACHING UNIT TITLE: Floral Design

COMPETENCY STATEMENT	TEST ITEM NO.
033. Prepare a potted plant for sale.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

033.1 Prepare a flowering potted plant or foliage plant to be wrapped.
033.2 Wrap a flowering potted plant or a foliage plant.
033.3 Make and place a bow on a plant for sale.
033.4 Create and/or use accessories as needed in preparing a plant for sale.

CONTENT	TEACHING ACTIVITIES	RESOURCES
033. I. Preparing a Plant For Sale A. Cleaning the Pot and Plant B. Wrapping with Foil C. Preparing and Placing a Bow on the Plant D. Adding Accessories 1. Plant Care Tag 2. Card/Card Holder	1. Have students prepare a foliage or flowering potted plant for sale in a flower shop.	2, 45, 46

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 22 (4 HOURS) TEACHING UNIT TITLE: Nursery Production

COMPETENCY STATEMENT	TEST ITEM NO.
034. Analyze various accepted principles in growing nursery stock.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

034.1 Identify various practices used in production of nursery stock.
034.2 Compare results of various practices used in production of nursery stock.
034.3 List all practices needed to produce a plant to salable size in a nursery.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 23 (4 HOURS) TEACHING UNIT TITLE: Nursery Production Practices

COMPETENCY STATEMENT	TEST ITEM NO.
035. Demonstrate accepted procedures for growing container stock.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

035.1 Pot nursery plants.
035.2 Water nursery plants.
035.3 Calculate fertilizer needs for plants.
035.4 Prune young nursery stock to train plant for mature form.

306

307

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 24 (2 HOURS) TEACHING UNIT TITLE: Nursery Production

COMPETENCY STATEMENT	TEST ITEM NO.
036. Plant bare root, balled and burlapped and container nursery stock.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

036.1 Demonstrate the correct procedure for planting bare root, balled and burlapped, and containerized nursery stock.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 25 (3 HOURS) TEACHING UNIT TITLE: Nursery Production

COMPETENCY STATEMENT	TEST ITEM NO.
037. Prepare specimens for mist bed propagation according to recognized criteria when given hardwood and softwood stem parts and a knife.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

037.1 Prepare for rooting 5 cuttings of 10 different plants using appropriate procedures.

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 26 (2 HOURS) TEACHING UNIT TITLE: Nursery Production

COMPETENCY STATEMENT	TEST ITEM NO.
038. Stratify and scarify seed to improve germination when given various samples of seed.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

038.1 Collect seed of woody plant and research the need for stratification and scarification.
038.2 Scarify with appropriate method the seed collected.
038.3 Stratify seed with appropriate method.

CONTENT	TEACHING ACTIVITIES	RESOURCES
034.-038. I. Facilities for growing nursery stock A. Cold frames B. Mist beds C. Lath houses D. Green houses E. Over wintering structures F. Land requirements 1. acreage 2. slope 3. soil characteristics G. Water H. Environmental impact	1. Have students develop a plan indicating equipment and facilities needed to produce 10,000 azaleas for sales per year	1, 15, 23, 30 31, 36, 37, 38 47, 54, 71, 90 91, 92, 99, 100, 102
II. Producing plants A. Propagation of liners 1. Sexual a. seed cultivation b. stratification c. scarification 2. Asexual a. hardwood cuttings b. softwood cuttings c. preparation of cutttings d. season to take cuttings e. equipment for rooting f. division or separation	1. Have students collect seed of a native plant and research sexual propagation requirements. 2. Scarify and stratify seed as needed. 3. Take 5 cuttings of 10 different plants and prepare appropriately and root.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
III. Production of containers or balled and burlapped plants A. When to remove from seed or rooting beds. B. Transplanting C. Root pruning D. Selection of container size E. Selection of media F. Watering G. Pruning to train growth H. Fertilizing needs I. Weed Control J. Disease and insect control K. Pricing and selling L. Inventory control and projection M. Winter protection IV. Setting out nursery stock A. Selection of choice plants B. Soil preparation C. Season D. Setting E. Watering F. Staking	1. Transplant rooted plants to appropriate area or container. 2. Root prune plants 3. Choose containers based on approprtiate size and growth habits. 4. Make/choose a good soil mix 5. Water potted plants 6. Calculate water requirements for 1 acre of container nursery. 7. Prune plants for training 8. Control insects, disease, and weeds. 9. Provide winter protection for plants 10. Make a calender of activities for producing 10,000 azaleas from cuttings to saleable plants.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
G. Fertilizing H. Pruning	1. Set out landscape size plants using accepted procedures. 2. Set out trees, stake, wrap and mulch appropriately.	

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 27 (2-4 HOURS) TEACHING UNIT TITLE: Lawn Establishment

COMPETENCY STATEMENT	TEST ITEM NO.
039. Identify lawn grasses adapted to the local area and the environment requirements for each. 040. Identify the steps in preparing a lawn seed bed.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

039.1 Identify local lawn grasses varieties.
039.2 List environment requirements for local lawn grasses.

040.1 List the steps necessary in preparing a turf seed bed.

CONTENT	TEACHING ACTIVITIES	RESOURCES
039.		
I. Identification of Lawn Grasses	1. Provide references for classroom study.	6, 8, 14, 31
A. Warm Season Varieties		47, 49, 84
1. Bermuda	2. Require students to make a chart showing characteristics of lawn grasses.	85, 97, 3
2. Zoysia		
3. Centipede		
4. St. Augustine	3. Make a collection of samples of local lawn grasses.	
5. Carpet		
B. Cool Season Varieties	4. Visit a golf course or lawn establishment business and make an oral report on the visit.	
1. Tall Fescue		
2. Kentucky Bluegrass		
3. Red Fescue	5. Have students interview people in charge of maintenance of lawn areas.	
4. Italian Ryegrass		
5. Bent Grass		
C. Variety Characteristics	6. Prepare a file that contains the varietal and cultural requirements of lawn grasses.	
1. Rate of Establishment		
2. Disease Tolerance		
3. Texture		
4. Shade Tolerance		
5. Wear Resistance		
6. Drought Tolerance		
7. Fertility Requirements		
8. Management Practices		
II. Environmental Conditions	1. Provide references for classroom study.	
A. Growing Season		
B. Rainfall	2. Require students to study rainfall and temperature maps and charts to determine the growing seasons and average annual rainfall.	
C. Temperature		
D. Shade		

CONTENT	TEACHING ACTIVITIES	RESOURCES
040. I. Seeding Practices for Lawns A. Proper Timing 1. Variety 2. Area Use 3. Environmental Condition B. Proper Seeding Rate C. Seeding Process 1. Distributing seed 2. Covering seed 3. Mulching seeded area a. selecting mulching material b. method of application	1. Provide references for classroom study. 2. Observe media resources available. 3. Let students compute seed requirements for for various size lawn areas. 4. Have students seed a lawn area using available mechanical devices.	6, 8, 14, 31, 47, 49, 84 85, 97, 3

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 28 (3-5 HOURS) TEACHING UNIT TITLE: Lawn Establishment

COMPETENCY STATEMENT	TEST ITEM NO.
041. Prepare lawn seed bed properly.	
042. Seed a lawn correctly.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

041.1 Prepare lawn seed bed properly.

042.1 Calibrate a seedling device.
042.2 Seed a lawn using a mechanical seeder.
042.3 Distribute seed uniformly.
042.4 Seed a lawn using recommended procedures.

CONTENT	TEACHING ACTIVITIES	RESOURCES
041. I. Preparing a Lawn Seedbed A. Tillage B. Remove Debris C. Lime Addition D. Fertilizer Addition	1. Provide references for classroom study. 2. Have students make a list of tools necessary for seedbed preparation. 3. Let students prepare a turf seedbed using a tiller and/or tractor equipment.	6, 8, 14, 31 47, 49, 84 85, 97, 3
042. II. Seed Lawn A. Review Procedure B. Seed Lawn	1. Provide references for classroom study. 2. Require students to seed lawn using correct measures.	6, 8, 14, 31 47, 49, 84 85, 97, 3

COURSE NO. & NAME: 6841, 6842 - HORTICULTURE I, II

TEACHING UNIT NO. 29 (4-6 HOURS) TEACHING UNIT TITLE: Lawn Establishment

COMPETENCY STATEMENT	TEST ITEM NO.
043. Establish or repair a lawn using sods, sprigs or plugs. 044. Describe several problems involved in establishing and maintaining lawn grass.	

INSTRUCTIONAL OBJECTIVES: Upon completion of this unit, the student will be able to:

043.1 Grid an area in order to obtain uniform spacing.
043.2 Plant a turfgrass stolon properly.
043.3 Transplant sod to a prepared lawn site.

044.1 Describe the proper cutting practices for local lawn grasses.
044.2 Recognize pest problems in lawn area.
044.3 Recognize the need for drainage when it exists.

CONTENT	TEACHING ACTIVITIES	RESOURCES
043. I. Lawn Establishment A. Sodding 1. Sources 2. When to Sod 3. Sod Laying a. Firm bed b. Layout of area c. Rolling procedures d. Irrigation B. Stolons 1. Sources 2. Methods of Planting a. Machine Distribution b. Hydrostolonization 3. Rolling 4. Topdressing 5. Irrigation C. Plugs 1. Sources 2. When to plant 3. Plugging II. Lawn Repair A. When Needed B. Methods 1. Sodding 2. Stolons 3. Plugs	1. Have students visit a turf nursery to observe the growing and harvesting of sod, stolons, and plugs. 2. Visit sites of sodding, stolon planting, and plugging. 3. Identify sources of sod, stolons, and plugs in local area. 4. Obtain samples of sod, stolons, and plugs and have students plant in a prepared area.	6, 8, 14, 31 47, 49, 84 85, 97, 3

CONTENT	TEACHING ACTIVITIES	RESOURCES
044. I. Lawn Maintenance A. Mowing 1. Safety 2. Time and Frequency 3. Mower Height 4. Direction of Mowing 5. Removing Clipping B. Aerating Equipment C. Thatch Removal	1. Provide references for classroom study. 2. Have students determine the method of adjusting height of cut on several different mowers. 3. Let students make height adjustments on mowers. 4. Show slides and transparencies of different types of lawn equipment. 5. Have students operate aerating and thatch removing equipment. 6. Visit an operation in which various lawn equipment is being used and have students write a report on their visit.	6, 8, 14, 31 47, 49, 84 85, 97, 3
II. Lawn Diseases A. Sources 1. Fungi 2. Bacteria 3. Viruses 4. Microplasma 5. Nonpathogenic Diseases B. Control 1. Resistant Varieties 2. Cultural Control	1. Provide references for classroom study. 2. Take students on a field trip to observe lawn diseases. 3. Using a recognized reference, have students identify lawn diseases. 4. Have students classify diseases according to caused agent.	

CONTENT	TEACHING ACTIVITIES	RESOURCES
3. Life Cycle of Diseases 4. Chemical Control a. equipment b. calibration of equipment c. safety	5. Let students use cultural methods as a means of disease control. 6. Have students study the life cycle of causal agents in order to determine time to apply controls. 7. Provide equipment for students to practice calibration of sprayer equipment.	
III. Lawn Insects/Animals A. Identifying Damage 1. Root Damage 2. Foliage Damage B. Life Cycle of Insects/ Animals 1. Growth Stages 2. Time of Season 3. Determining Control C. Types of Control 1. Natural 2. Biological 3. Exclusion 4. Cultural 5. Chemical D. Determining Measures to Use 1. Identifying Insect/ Animal 2. Prescribe Control 3. Applying Control	1. Require students to collect and identify five turf insect pests. 2. Have students study the life cycle of insects in order to determine the best type of control and time to apply for best results. 3. Using reference materials, have students identify and recommend controls for specific pests. 4. Invite a guest speaker in on methods of commercial control available.	

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